THE IRON AGE

Established 1855 — New York, November 24, 1910 — Vol. 86: No. 21

Published Every Thursday by the
DAVID WILLIAMS COMPANY
14-16 Park Place, New York

Entered at the New York Post Office as Second Class Mail Matter.

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.50 per Annum; to Other Foreign Countries, $10.00 per Annum. Single Copies, 20 Cents.

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Output Still Declining

Rail Specifications Under Discussion

Pig Iron Markets Quieter—Heavy Inquiry for Coke

Current developments in the iron trade are of small importance and little change is looked for in the remainder of the year. In pig iron production there is a slight falling off, but even so stocks are still increasing. The United States Steel Corporation has made a further reduction in active blast furnace capacity to prevent holiday accumulations.

In addition to rail orders already announced, the Lackawanna recently bought 9400 tons for new work, the order being divided between two mills. Its requirements for replacements have not yet been made up. The Lehigh Valley has placed 3400 tons, but its total purchases for 1911 are expected to be 20,000 tons. The Pennsylvania and New York Central orders, which together are put at 240,000 tons, are delayed by changes in specifications which have already had consideration at a meeting of rail company presidents. The total of pending rail business is about 400,000 tons.

Some of the railroads are figuring on bridge work, but car orders are coming out slowly. Chicago finds some indications of a more liberal buying policy by railroad car and repair shops.

The leading fabricating interest has five months' work ahead, and there are some good prospects in structural lines. One item is the practical certainty of early action on the New York Subway work. For the post-office at the Pennsylvania terminal bids will be opened next week for 6200 tons. A Pittsburgh company has taken 1700 tons for a ferry house at Cortlandt street, New York. The shaping of a new building code is holding up 20,000 tons of steel work represented in Chicago building projects.

Much has been made in the press of recent changes in prices on plain material from the warehouses of the leading interest. These apply to a relatively unimportant tonnage and readjust store prices to the reductions made earlier in the year on mill shipments.

Wrought pipe mills have been occupied largely on replacement orders for dealers' stocks. Line pipe inquiry has fallen off, but there is good prospect of the revival of the Busch-Everett Syndicate's plans for a gas pipe line from Louisiana to St. Louis, which would take about 450 miles of 20-in. pipe.

Bar mills are still receiving good specifications on agricultural contracts, and prices on steel bars are firm. Two companies which largely depend on this trade are operating an exceptionally high percentage of their capacity.

A change has been made in the method of quoting

on billets and sheet bars in the Pittsburgh district, and hereafter these prices will be f.o.b. Pittsburgh, with full freight added. The practice has long been for the mills to absorb a portion of the freight on these shipments.

Pig iron markets are quieter, though some fair sales have been made at Chicago, in which Southern furnaces have shared to a greater extent than for some time. The Southern situation is weaker, yet the principal producers there hold aloof, their $11.50 basis being below the competitive basis fixed by sales of Northern iron.

Steel making iron is firm. Bessemer iron is maintained at $15 by Valley furnaces, with several good inquiries pending, and $13.50 is minimum for basic, while $13.75 is asked for delivery over the first quarter of next year.

An effort is being made at Pittsburgh to establish a central selling agency for leading independent producers of coke. Of late, under the pressure of the large output, sales have been made below the cost of production. A number of blast furnace companies are in the market for the first half of 1911. One contract for a two years' supply was made by a Wheeling district consumer, on a sliding scale basis, settlements to be made at one-eighth the monthly average prices of basic iron.

Lake Superior ore stocks on Lake Erie docks at the close of navigation will be the greatest on record, due to the curtailment of blast furnace operations. Estimates put the December 1 total at 10,000,000 tons, as against 8,865,000 tons on the same date last year.

The Relation of Fixed to Liquid Capital

Those who hold that the readjustment of values and credits in the United States which seemed likely to follow closely the panic of 1907, but did not, is now under way, will find something closely related to their thinking on this subject in the presidential address of A. Barton Hepburn at the Chamber of Commerce dinner in New York last week. The predictions made by bankers in 1906 and 1907 of the consequences to be expected from a great conversion of liquid capital into fixed forms may not be forgotten. Mr. Hepburn, at all events, revives them in referring to the demand upon the banks resulting from the conversion of real into personal property. In many cases, he points out, the hope in incorporating or combining real property "is to sell the resulting stocks and bonds to the general public at prices which anticipate all accretion in values for many years to come." The effect upon banking operations is described thus:

> Many real estate properties heretofore financed by loans from mortgage companies, savings banks and insurance companies or individuals, by this transition to corporations, have brought into existence a new class of securities very large in volume. Naturally they seek a market in our money centers and this makes a demand upon commercial banks. This demand added to the requirements of current business has subjected the personal wealth of the country to a severe strain—a strain not upon our currency, but upon our mobile capital. Until this transition process somewhat abates a very strong demand upon personal capital must continue to exist.

President Hepburn's views bring this response from a thoughtful financial article in the *Evening Sun* of November 19:

> The upshot of most competent thinking on the situation denoted by banking statistics is that a large portion of the loan account of the banking institutions of the country as a whole has apparently become fixed in its character, that there is a well defined trend in bank loans to increase this fixed or abiding portion, and that banking resources, summed up under the general head of loans, are far from as liquid as they should be. What this means, if it means anything in the light of such utterances as those already quoted, is that the banks of the country have become to an undesirable extent partners and investors in the country's industrial enterprise instead of lenders to it. If this is the situation denoted by a loan account, which in the last decade has shown contractibility only in the most highly speculative quarters of its extension, by the heaping up of loans on occasionally falling reserves and by the discrepancies which appear in the changes in loan and deposit items, it is one which is more rather than less likely to be discussed gravely and in all seriousness in the times which are ahead.

The extent to which liquidation is yet to be expected, in credit and commodities, and in security and labor values, is a question of the highest importance. It goes deeper than railroad rates, the legality of consolidations, the proper level of the tariff and other issues that are popularly regarded as holding the making or the marring of our prosperity.

Stimulating Workmen's Ambitions

Some of the articles on conditions of labor, which appear from time to time in popular publications, exert an unwholesome influence upon the workman, in that he is made to believe himself to be regarded merely as a machine of no account to the owner beyond immediate results as a producer. If he succeeds in bettering his condition, according to this preaching, it is in spite of, rather than with the help of, the employer. The articles are usually well meant, but they are likely to do great harm in the impression which they may create, tending to widen any breach which may exist between capital and labor. In an article published recently in one of the most widely read of the weekly periodicals appears this paragraph:

> Full of blood, hope and curiosity, the young mechanic tackles his first job—say, in a boring mill. In two weeks or less he finds that any information about the use of the part he is making is curtly refused by the foreman, or as curtly given in a monosyllable; while the men around him, on similar work, don't know and don't care. A year or two of such conditions will either drive him into other employment or settle him doggedly into the regular routine groove.

Further on in the article is this astonishing statement:

> The superintendent of a manufacturing plant of over 800 hands states that, during the past two years, he has been obliged to replace five foremen by reason of deaths and resignations; and in each case he has gone outside and found his man.
>
> "It is possible," he said, "that there are men here in the shops capable enough, but I've never seen any evidence of it. And we can't take any chances. We have to hunt up foremen somewhere who've shown what they can do."

As to the assertion that a young mechanic is discouraged at every turn in his efforts after information, the foreman in most modern establishments who would refuse an answer to questions would have short shrift when the practice was discovered. The whole theory of present manufacturing management is to stimulate the workman's endeavor to ascend the industrial ladder. Owners realize very well that in the rank and file of their working forces exists a great latent brain force which it is very profitable to develop. A great many useful, sometimes very valuable, suggestions come from those who work at a machine or bench. Material for higher positions must be found, in preparation for vacancies to come. One essential of a superintendent or foreman is his ability to locate the good in his men and to bring it out. The surly "boss"

is known as a poor investment. Many concerns go to much expense and trouble to provide special ways of increasing the knowledge and efficiency of their men. Even money rewards for ideas are given. Premium systems are increasing in number, with this as one of the most useful purposes. The apprentice system is a part of the same effort, and manufacturers are co-operating enthusiastically in the various forms of trade schools.

The young machinist would do well to leave the shop where he is treated as stated in the paragraph above quoted. Probably he would have a hard time in finding a repetition of such conditions. In small establishments the owners themselves make it a practice to keep sharp watch for indications of exceptional ability among their employees. In larger works the division superintendents and their foremen are expected to exercise the function. Most foremen and many superintendents have had their initial training in the plants where they perform their administrative duties. Drafting rooms are recruited with young mechanics, whose ability as designers has been brought out by a paternal interest. While the trend of the day is toward specialization of labor, at the same time it is toward the advancement of a workman, where he is found to possess more than average ability. A great many men, constituting the large majority, will get into ruts, and nothing that any one can do for them will change them, but the man who stays in a rut does so in spite of the efforts of intelligent employers.

The statement that in a works employing 800 men the superintendent had no knowledge of his people, to the extent of finding one of them of sufficient ability to warrant promotion, indicates plainly that something was wrong with his system, a wrong that did not exist, apparently, in the plants from which he hired five foremen. He should have been in closer touch with his men, either directly or through his foremen. It is not too much to state that never has it been so well realized by employers that it is well worth while, from every point of view, to cultivate the ability of the workman, and that the movement promises to become more intensified as time goes on. The need of efficient men requires it.

Iron and Steel Stocks and Consumption

Lest the accumulation of pig iron stocks at the merchant blast furnaces of the country be given undue importance, it has been pointed out that statistics on this subject need interpretation. It has been said with truth that besides the figures representing pig iron in furnace yards it is necessary to know whether consumers have little or much pig iron in their yards. Twelve months have brought a complete reversal of the situation as to stocks, both in pig iron and in finished materials. A year ago the process of restocking was going on. Foundries, machine shops—all the metal working industries—were building up stocks that for two years or more had been allowed to run down. The same was true of jobbers and of dealers, large and small, in all iron and steel lines. It became well established early in 1910 that this rebuilding of stocks was making the remarkable demand upon blast furnaces and rolling mills, and that the country had not come so soon after the depression of 1908 to a consumption of more than 30,000,000 tons of pig iron in one year.

From what is known in a general way of the scale of operations in industries consuming iron and steel—that work the product of the rolling mill or the blast furnace into other forms—there has been no such shrinkage in the past 10 months as is represented by an annual rate of 31,600,000 tons in the pig iron production of February and of a little more than 24,000,000 tons in that of to-day. In the early months of the year the restocking movement culminated. To-day the consumer of pig iron buys sparingly and lets the furnace carry the stocks; the user of rolled steel, judging that prices will not advance and may recede, limits his purchases and lets his supply on hand run as low as prudence allows, and often lower. The volume of unfilled orders in the hands of manufacturers is meanwhile steadily cut down, and there is as much exaggeration of the actual decrease in consumption as 11 or 12 months ago there was exaggeration of the actual increase.

It is no easy matter, with such a reversal of conditions in so short a period, to determine the real consumption of iron and steel for the year. Pig iron production may be estimated at somewhat under 27,300,000 tons, or about 1,500,000 tons more than in 1907 and 1909, when the totals were 25,781,361 tons and 25,795,471 tons, respectively. Exports have been considerably more than in 1909, and stocks at furnaces are much larger than at the beginning of the year. However, with the offset of stock depletion by consumers, it appears that in spite of limited railroad demand, 1910 will establish a noteworthy record in the home consumption of iron and steel.

Shortening the Working Day

One of the most important matters brought to the attention of the National Founders' Association at its convention held in Chicago last week was the persistency of efforts to curtail the working day. This movement manifests itself in various directions. In his report to the convention President Briggs alluded to the condition of affairs on the Pacific slope where the Iron Molders' Union and the Machinists' Union have been successful in forcing an agreement with employers in San Francisco for an eight-hour day. As our readers have been previously informed, this movement for a shorter day began in 1907, when an agreement was made with employers of molders and machinists that the working hours in San Francisco were to be reduced 15 minutes every six months until the eight-hour day was reached, which was in June of this year. A condition was attached to this agreement, however, whereby the unions promised to have in effect at the same time the eight-hour day both north and south of San Francisco. Although aggressive efforts were made by them in enforcing strikes in both foundries and machine shops in other places on the Pacific Coast, the employers resisted so stubbornly that the unions have not been successful. Their failure, however, instead of resulting in the San Francisco unions retiring from their stand for an eight-hour day in that city, appears merely to have made those unions more determined in their position, with the result that an eight-hour day now appears to be a fixed regulation there unless the employers shall eventually decide to precipitate a struggle for the settlement of this question on a different line. It would seem that the Pacific Coast had been selected as good fighting ground by the unions for the establishment of a general shorter working day. Their

officers have declared that as soon as an eight-hour day was established on the Coast, as contemplated, they would then enforce it on this side of the Rocky Mountains.

Other developments in the establishment of a shorter working day have been the incorporation in certain legislation at Washington the provision that on Government work the eight-hour day shall be in effect, and the announcement as made by President Briggs that demands have been made by the Iron Molders' Union upon the Stove Founders' National Defense Association that the hours of molding in stove shops shall be reduced from seven to six. The goal of the Iron Molders' Union has been eight hours with ten hours' pay, with the expectation that if eight hours are reached the next step would be to make the day seven hours and then six hours.

In view of these conditions the action taken by the National Founders' Association is noteworthy. A resolution was adopted, as set forth in the proceedings of the convention printed elsewhere in this issue, stating that the association is opposed to any reduction in the hours of working below those now established, because it is believed that such reduction would be harmful to both manufacturer and consumer. It is pointed out that the movement of labor unions for a shorter workday, restriction of output and higher wage is directly responsible for higher cost of production and consequently higher cost of living.

Possibly no class of consumers in this country is more vehement in complaining of the high cost of living than wage earners. They blame everybody and everything for the advance in the cost of living but themselves. The workmen in the building trades in large cities complain of high rents, while at the same time, by the enforcement of short hours and the exaction of exorbitant wages, they have so increased the cost of building that owners are compelled to name higher rents for the purpose of getting anything like a satisfactory return on their investment in buildings. The movement travels in a circle, one set of wage earners demanding higher wages because the price of necessaries produced by another set of workmen has been advanced to a pinching point.

It would certainly appear as if the movement for a shorter workday should be opposed vigorously by all classes of manufacturers as an economic proposition. The working day as now established in many occupations is sufficiently short from a humanitarian and sociological standpoint. The hours are not the same in all occupations, and it is perhaps impossible and assuredly impracticable to try to make them uniform. The movement for a still shorter workday will not only further increase the cost of living, but will put this country more and more at a disadvantage in competition with manufacturers in other countries. The interrelation of industries throughout the world is now such that international competition must henceforth be seriously considered.

Correspondence

Typewriter Spacing

To the Editor: I note that at page 1110 you are asked by the W. J. Clark Company if you can influence typewriter manufacturers to arrange for a spacing between lines equal to one and one-half times the space of the present narrowest spacing. Permit me to say that the Remington typewriter can be arranged to give such spacing when required.

FRED J. MILLER.

280 BROADWAY, NEW YORK, November 17, 1910.

L. R. Wister & Co. in Financial Difficulty.—Creditors filed a petition in the United States District Court at Philadelphia, November 19, asking that L. & R. Wister & Co., Rodman Wister, Jones Wister and J. N. M. Shimer, co-partners, iron merchants, 672 Bullitt Building, Philadelphia, Pa., be adjudged involuntary bankrupts. The act of bankruptcy alleged is allowing judgment to be entered on claims upon which execution has been issued. The petitioning creditors are the Farmers' National Bank, Ephrata, Pa.; Harrisburg (Pa.) National Bank, and the Southwark National Bank of this city. Counsel for the creditors in this case also ask that the Dunbar Furnace Company, Dunbar, Pa., in which L. & R. Wister & Co. are involved, and for which concern a receiver was recently appointed, be also adjudged an involuntary bankrupt. Both L. & R. Wister & Co. and W. C. Harris, receiver for the Dunbar Furnace Company, will present statements to the court at an early date.

Tables of Lake Iron Ore Values.—Announcement is made by F. M. Catlin, sales agent, St. Paul, Minn., that a book will be published soon after the fixing of prices for lake ores for 1911, with the title, "Hurd's Tables of Iron Ore Values of the Lake Superior District." It will contain schedules of ore values at Lake Erie for every per cent. and fraction, of every grade of ore from 40 per cent. to 61 per cent.; general statistical data of the Lake Superior region from 1855 and for each iron range for every year; shipments, rail and lake freights, ore and pig iron prices; geological and mineralogical description; the iron ore reserves of the United States, and the iron ore valuation and method of the Minnesota Tax Commission. The author is Rukard Hurd, C. E., secretary of the Minnesota Tax Commission.

The National Metal Trades Association's Annual Meeting.—The Administrative Council of the National Metals Trades Association has issued a call fixing the time and place of holding the next annual convention of that association. It will be held during the week of April 14, 1911, at the Hotel Astor in New York City. J. H. Schwacke, president of the association, has called a meeting of the Executive Committee to be held at the Hotel Astor December 6.

The Kroenert Smelting & Refining Company, 6620-6626 Kelly street, East End, Pittsburgh, Pa., manufacturer and dealer in metals, has recently increased its capital from $14,000 to $20,000, to give it additional working funds to carry on a larger business. The company operates a new plant, having melting furnaces and other equipment for the refining of metals, such as solder, babbitt, pig tin and lead, type metal, &c., and is operating day and night. It recently established a Western sales office in Chicago. G. A. Kroenert is secretary and treasurer of the company, and has personal charge of its general sales.

The National Association of Brass Manufacturers will hold its annual meeting at the Hotel Astor, New York, December 13 and 14. Questions of modern methods of production and trade policies will be taken up for discussion, and officers will be elected for the ensuing year.

The Colorado Fuel & Iron Company

Annual Report for the Year Ending June 30, 1910

The Colorado Fuel & Iron Company has issued its complete report for the fiscal year ending June 30, 1910. Following is the income account:

Gross earnings from operation	$23,639,813.08	
Operation and management	19,897,197.93	
Net earnings from operation		$3,742,615.15
Add:		
Income from securities	499,079.84	
Interest and exchange	127,839.65	
		$4,369,534.64
Deduct:		
Bond interest	$2,097,682.50	
Taxes	218,764.64	
		2,316,457.14
Surplus over fixed charges		$2,053,077.50
Less:		
Provision for sinking funds, etc.	$171,457.56	
Insurance, &c.	154,908.11	
Equipment renewal	164,945.44	
Traffic contract guaranty	36,000.00	
Prospecting	18,947.51	
		546,258.62
Surplus for fiscal year, to credit of profit and loss		$1,506,818.88

The balance sheet, as of June 30, is as follows:

Assets.		
Iron ore, coal, limestone and other lands		$57,650,115.00
Equipment at steel plant, coal mines, coke ovens, &c.		28,082,010.53
Railroads		5,854,000.49
Cooperage plant		34,037.65
Timber lands, franchises, buildings, &c.		36,184.41
Store buildings, lots and equipment		389,628.45
Inventories—Supplies and manufactured stocks		4,033,465.51
Accounts receivable		3,111,117.07
Cash on hand		2,683,951.00
Bills receivable		84,784.05
Securities—Stocks and bonds		238,958.90
Cash held by trustees		16,549.41
Reserve funds		99,840.77
Accrued interest on securities		6,077.34
Payment of royalties in advance		37,720.38
Total assets		$102,358,240.96
Liabilities.		
Capital stock of Colorado Fuel & Iron Company:		
Common stock	$34,235,500.00	
Preferred stock	2,000,000.00	
		$36,235,500.00
Funded debt:		
Colorado Fuel & Iron Company general mortgage 5 per cent. bonds	$5,515,000.00	
Colorado Fuel & Iron Company 5 per cent. 10-year convertible debentures	993,000.00	
Colorado Fuel Company general mortgage 6 per cent. bonds	863,000.00	
Colorado Industrial Company 5 per cent. bonds	33,848,000.00	
Rocky Mountain Coal & Iron Company first mortgage 5 per cent. bonds	554,000.00	
Grand River Coal & Coke Company first mortgage 6 per cent. bonds	877,000.00	
Pueblo Realty Trust Company 6 per cent. mortgage bonds	575,000.00	
		42,725,000.00
Accounts payable, payrolls, &c.		1,908,629.24
Accrued bond interest, not due		862,746.68
Accrued taxes, not due		113,500.00
Total liabilities		$81,845,375.92
Excess of assets over liabilities		20,512,865.04
		$102,358,240.96

The production of the company's mines, furnaces and mills was as follows, in tons of 2000 lb.:

	Year ended June 30, '10.	Increase.
Iron ore mined	879,630	298,846
Limestone quarried	407,517	43,542
Pig iron produced	385,602	90,068
Coal mined:		
For making coke	1,566,549	
At company plants	636,883	
Commercial sales	2,519,000	
	4,722,832	628,481
Coke manufactured	905,599	260,055
Finished iron and steel	412,749	52,956

In his accompanying comments President J. F. Welborn says that the gross earnings from operation showed an increase over the last previous year of 16 per cent.; operating expenses, an increase of 14 per cent.; net earnings from operation, an increase of 29 per cent.; net income from all sources, an increase of 34 per cent.

"After providing for all fixed charges, sinking funds, &c., there remains a surplus of $1,506,818.88 carried to the credit of profit and loss. The debit balance in profit and loss account June 30, 1909, was $467,505.30, the lowest it had been since June 30, 1905, when it was $1,877,402.95. The surplus for the past year takes care of this balance, as well as various small charges to profit and loss, and leaves a credit balance in the account amounting to $983,554.09.

"The demand for coal was fully up to our capacity during practically all of the year, but operations at the coal mines were so retarded by shortage of railroad cars during the fall and winter months as to cause a loss in output of close to 200,000 tons; yet the total coal production for the year was 4,722,832 tons, being 628,481 tons, or 15 per cent. greater than the previous year. Of this 3,100,000 tons, or 65 per cent. were sold as coal and in the form of coke, and the remainder used in the operation of steel works and other plants.

"The physical condition of the plants has been well maintained and in many respects improved during the year, yet the increasing demand for open hearth steel will make necessary some enlargement of the open hearth department in the near future. The surplus from the past year's operations will enable us to proceed with these additional improvements without borrowing money, and business conditions warrant this increased equipment.

"Business for the current year promises well and earnings in the first quarter just closed compare favorably with corresponding period last year. Operations since August 1, however, have been interfered with by shortage of railroad cars to an extent unusual at this season of the year, the loss in coal production during August and September from that cause having been in excess of 100,000 tons."

It is announced that when the Grand Trunk track elevation work now in progress in Montreal is completed, the use of steam locomotives in the company's intra-city lines will be discontinued and electrically driven engines will take their places. Additional capital for the terminal and electrification purposes will, it is said, be provided for by legislation to be obtained in the present session of the Canadian Parliament. The plant which the Canadian Light & Power Company is erecting at St. Timothy, Montreal, is owned by interests close to the Grand Trunk directorate. This plant, which will produce 100,000 hp., is expected to be ready for operation by the time the Grand Trunk has completed its track elevation and other terminal arrangements in Montreal.

The Kelker Blower & Forge Company, 533 Elk street, Buffalo, N. Y., which is having plans prepared for a new factory building at Westcott and Milton streets and the Pennsylvania Railroad, will require considerable equipment for the new plant in the line of shears and riveting machinery, also electric motors.

The Linde Air Products Company, Cecil Lightfoot, general manager, Chandler and Manton streets, Buffalo, N. Y., is having plans prepared for a branch factory to be built at Newark, N. J., to be 130 x 130 ft., two stories, brick and steel construction.

The Thomas Iron Company has blown out one of its Saucon furnaces at Hellertown, Pa.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Nov.23, 1910.	Nov.16, 1910.	Oct.26, 1910.	Nov.24, 1909.
PIG IRON, Per Gross Ton:				
Foundry No. 2, standard, Philadelphia	*$15.50*	$15.75	$15.75	$19.00
Foundry No. 2, Southern, Cincinnati	14.25	14.25	14.25	17.75
Foundry No. 2, local, Chicago	16.00	16.00	16.00	19.00
Basic, delivered, eastern Pa.	*14.75*	14.75	15.00	18.75
Basic, Valley furnace	**13.50**	13.25	13.00	17.25
Bessemer, Pittsburgh	15.90	15.90	15.90	19.90
Gray forge, Pittsburgh	*13.90*	14.15	14.15	17.40
Lake Superior charcoal, Chicago	18.00	18.00	18.00	19.50
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	*23.00*	23.50	23.50	27.50
Forging billets, Pittsburgh	*28.50*	28.50	29.00	31.00
Open hearth billets, Philadelphia	*25.50*	25.50	26.00	30.60
Wire rods, Pittsburgh	*28.00*	28.00	28.50	33.00
OLD MATERIAL, Per Gross Ton:				
Steel rails, melting, Chicago	13.50	13.50	13.50	17.25
Steel rails, melting, Philadelphia	*13.50*	13.50	13.75	18.00
Iron rails, Chicago	16.00	16.00	16.00	19.50
Iron rails, Philadelphia	18.00	18.00	18.00	21.00
Car wheels, Chicago	*13.50*	13.50	14.00	18.50
Car wheels, Philadelphia	13.75	13.75	13.75	17.50
Heavy steel scrap, Pittsburgh	14.25	14.25	14.25	17.50
Heavy steel scrap, Chicago	12.25	12.25	12.25	16.00
Heavy steel scrap, Philadelphia	*13.50*	13.50	13.75	18.00
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Steel rails, heavy, at mill	1.25	1.25	1.25	1.25
Refined iron bars, Philadelphia	*1.37*	1.37	1.40	1.65
Common iron bars, Chicago	1.35	1.35	1.35	1.60
Common iron bars, Pittsburgh	*1.40*	1.45	1.45	1.70
Steel bars, tidewater, New York	1.56	1.56	1.56	1.66
Steel bars, Pittsburgh	1.40	1.40	1.40	1.50
Tank plates, tidewater, New York	1.56	1.56	1.56	1.71
Tank plates, Pittsburgh	1.40	1.40	1.40	1.55
Beams, tidewater, New York	1.56	1.56	1.56	1.71
Beams, Pittsburgh	1.40	1.40	1.40	1.55
Angles, tidewater, New York	1.56	1.56	1.56	1.71
Angles, Pittsburgh	1.40	1.40	1.40	1.55
Skelp, grooved steel, Pittsburgh	*1.25*	1.25	1.30	1.55
Skelp, sheared steel, Pittsburgh	*1.30*	1.35	1.40	1.60
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	2.20	2.20	2.20	2.30
Wire nails, Pittsburgh*	1.70	1.70	1.70	1.80
Cut nails, Pittsburgh	*1.60*	1.60	1.65	1.80
Barb wire, galv., Pittsburgh*	2.00	2.00	2.00	2.10
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	**13.00**	13.00	12.87½	14.00
Electrolytic copper, New York	**12.87½**	12.87½	12.80	13.75
Spelter, New York	**5.95**	5.95	5.60	6.40
Spelter, St. Louis	**5.80**	5.80	5.45	6.25
Lead, New York	**4.50**	4.40	4.40	4.40
Lead, St. Louis	**4.40**	4.30	4.27½	4.27½
Tin, New York	**36.90**	36.50	36.15	31.30
Antimony, Hallett, New York	7.75	7.75	7.75	8.25
Nickel, New York	45.00	45.00	45.00	45.00
Tin plate, 100 lb., New York	$3.84	$3.84	$3.84	$3.84

* These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought boiler tubes.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.40c. to 1.45c., net; I-beams over 15 in., 1.50c. to 1.55c., net; H-beams over 8 in., 1.55c. to 1.60c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.40c. to 1.45c., net; angles over 6 in., 1.50c. to 1.55c., net; angles, 3 in., on one or both legs, less than ¼ in. thick, 1.45c., plus full extras as per steel bar card, effective September 1, 1909; tees, 3 in. and up, 1.40c. to 1.45c., net; zees, 3 in. and up, 1.40c. to 1.45c., net; angles, channels and tees, under 3 in., 1.45c., base, plus full extras as per steel bar card of September 1, 1909; deck beams and bulb angles, 1.70c. to 1.75c., net; hand rail tees, 2.50c.; checkered and corrugated plates, 2.50c., net.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.40c. to 1.45c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼-in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16 in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Gauges under ¼-in. to and including 3-16-in. on thinnest edge	$0.10
Gauges under 3-16-in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates), 3 ft. and over in length	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

TERMS.—Net cash 30 days.

Sheets.—Makers' prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows: Blue annealed sheets, Nos. 3 to 8, 1.60c.; Nos. 9 and 10, 1.65c.; Nos. 11 and 12, 1.70c.; Nos. 13 and 14, 1.75c.; Nos. 15 and 16, 1.85c. One pass, cold rolled, box annealed sheets: Nos. 10 and 11, 1.85c.; Nos. 12 to 14, 1.90c.; Nos. 15, 16 and 17, 1.95c.; Nos. 18 to 21, 2c.; Nos. 22, 23 and 24, 2.05c.; Nos. 25 and 26, 2.15c.; Nos. 27 and 28, 2.20c.; No. 29, 2.25c.; No. 30, 2.35c. Three pass, cold rolled sheets, box annealed, are as follows: Nos. 15 and 16, 2.05c.; Nos. 17 to 21, 2.10c.; Nos. 22 to 24, 2.15c.; Nos. 25 and 26, 2.20c.; No. 27, 2.25c.; No. 28, 2.30c. Galvanized sheets, Nos. 10 and 11, 2.20c.; Nos. 12, 13 and 14, 2.30c.; Nos. 15, 16 and 17, 2.45c.; Nos. 18, 19, 20 and 21, 2.60c.; No. 22, 2.60c.; Nos. 23 and 24, 2.70c.; Nos. 25 and 26, 2.90c.; No. 27, 3.05c.; No. 28, 3.20c.; No. 29, 3.30c.; No. 30, 3.50c. Painted roofing sheets, No. 28, $1.55 per square. Galvanized sheets, No. 28, $2.75 per square for 2½-in. corrugations. All above prices are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount 10 days from date of invoice.

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 1:

	Steel. Black.	Steel. Galv.	Iron. Black.	Iron. Galv.
Butt Weld.				
⅛, ¼, ⅜ in.	72	58	68	54
½ in.	75	63	71	59
¾ to 1½ in.	79	69	75	65
2 to 3 in.	80	70	76	66
Lap Weld.				
2 in.	76	66	72	62
2½ to 4 in.	78	68	74	64
4½ to 6 in.	77	67	73	63
7 to 12 in.	75	59	71	55
13 to 15 in.	51½	..	..	..
Butt Weld, extra strong, plain ends, card weights.				
⅛, ¼, ⅜ in.	69	59	65	55
½ in.	74	68	70	64
¾ to 1½ in.	78	72	74	68
2 to 3 in.	79	73	75	69
Lap Weld, extra strong, plain ends, card weight.				
2 in.	75	69	71	65
2½ to 4 in.	77	71	73	67
4½ to 6 in.	76	70	72	66
7 to 8 in.	69	59	65	55
9 to 12 in.	64	54	60	50
Butt Weld, double extra strong, plain ends, card weight.				
¼ in.	64	58	60	54
¾ to 1½ in.	67	61	63	57
2 to 3 in.	69	63	65	59
Lap Weld, double extra strong, plain ends, card weight.				
2 in.	65	59	61	55
2½ to 4 in.	67	61	63	57
4½ to 6 in.	66	60	62	56
7 to 8 in.	59	49	55	45

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Plugged and Reamed.

1 to 1½, 2 to 3 in.	Butt Weld	Will be sold at two (2) points lower basing (higher price) than merchant or card weight pipe, Butt or Lap Weld as specified.
2, 2½ to 4 in.	Lap Weld	

The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

	Steel.	Iron.
1 to 1¼ in.	49	43
1¾ to 2¼ in.	61	43
2½ in.	63	48
2¾ to 5 in.	69	55
6 to 13 in.	61	43

2½ in. and smaller, over 18 ft., 10 per cent. net extra.
2¾ in. and larger, over 22 ft., 10 per cent. net extra.
Less than carloads to destinations east of the Mississippi River will be sold at delivered discounts for carloads lowered by two points, for lengths 22 ft. and under; longer lengths, f.o.b. Pittsburgh.

Wire Rods.—Bessemer rods, $28; open hearth and chain rods, $28.50.

Steel Rivets.—Structural rivets, ¾ in. and larger, 1.90c., base; cone head boiler rivets, ¾ in. and larger, 2c., base; ⅝ in. and 11-16 in. take an advance of 15c., and ½ in. and 9-16 in. take an advance of 50c.; in lengths shorter than 1 in. also take an advance of 50c. Terms are 30 days, net cash, f.o.b. mill.

Pittsburgh

PARK BUILDING, November 23, 1910.—(*By Telegraph.*)

Pig Iron.—Several large lots have been sold. The American Steel Foundries has bought 10,000 tons of basic for its Alliance, Ohio, plant and local consumers have bought 3000 to 3500 tons of gray forge for first half at $13, Valley furnace, or $13.90, Pittsburgh. A sale of 1200 tons of standard Bessemer for first quarter is reported at $15 at furnace. Several large lots of Bessemer are under negotiation and may be closed within a week. Although there is more pressure by furnacemen and dealers to sell iron, prices are strong, especially basic, which is now held at $13.50 minimum at Valley furnace. We quote for delivery in first half of next year as follows: Standard Bessemer, $15; malleable Bessemer, $13.75 to $14; gray forge, $13; basic, $13.50 to $13.75, and No. 2 foundry, $14, all at Valley furnace, the freight to Pittsburgh being 90c. a ton.

Steel.—Reports that an inquiry is in the market for 40,000 tons of sheet bars for first half of next year cannot be confirmed and are believed to be untrue. However, there is some inquiry for billets and sheet and tin bars for first quarter. The steel mills now quote entirely on an f.o.b. basis, Pittsburgh, with freight to destination added. We quote Bessemer and open hearth billets, 4 x 4 in. and up to but not including 10 x 10 in., at $23, base, and sheet and tin bars in 30 ft. lengths $24.50, f.o.b. Pittsburgh, full freight to destination added.

(*By Mail.*)

Reports from several of the leading steel companies indicate that specifications against contracts so far this month have been about equal to, or slightly in excess of, the same period last month. While the feeling for the future is optimistic, it must be admitted that general conditions in the iron trade are quieter now than they were two weeks ago, and the material swell expected in volume of business after the election has not materialized. Not much betterment is looked for until after the turn of the year, as we are now close to inventory period and as little material as possible will be taken in by consumers until January. There is more pressure by furnaces and dealers to sell pig iron, but so far there has been no easing off in prices. Bessemer pig iron continues firm, at $15, at Valley furnace, for first half, while basic has advanced squarely to $13.50, at furnace, some sellers declining to accept this price for deliveries running through first half. A change has been made in the method of quoting billets, and sheet and tin bars and now all quotations are made f.o.b. Pittsburgh, full freight to destination added. Under the old method of quoting prices the mills absorbed part of the freight. Some of the leading coke operators are working on a project to establish a central selling agency, and endeavor to raise prices, which have been badly demoralized for some months. A meeting of those interested was to be held in this city November 25, but it has been postponed until a later date. The scrap trade is quiet, and probably will remain so until after the turn of the year.

Ferromanganese.—The low prices ruling on ferromanganese are attractive to buyers. A large consumer in the Mahoning Valley has bought 1500 to 2000 tons for first half on the basis of about $38.50, Baltimore, and another consumer in the Shenango Valley has closed for about 1500 tons for first half at about the same price. We quote foreign 80 per cent. for first half delivery at $38.50 to $38.75, Baltimore, the freight rate for delivery in the Pittsburgh district being $1.95 a ton.

Ferrosilicon.—There is practically no new demand, consumers being well covered. We quote 50 per cent. for delivery over the first six months of next year at $55 to $55.50, and for prompt delivery at $56 to $56.50. We quote 10 per cent. blast furnace silicon at $23; 11 per cent., $24; 12 per cent., $25, f.o.b. cars, Jisco and Ashland furnaces.

Skelp.—A sale of about 1200 tons of sheared steel skelp is reported on the basis of about 1.35c., Pittsburgh. Most consumers who buy in the open market are pretty well covered for the next two to three months. We quote grooved steel skelp, 1.25c. to 1.30c.; sheared steel skelp, 1.30c. to 1.35c.; grooved iron skelp, 1.60c. to 1.65c., and sheared iron skelp, 1.70c. to 1.75c., all for delivery at consumers' mills in the Pittsburgh district, usual terms.

Rods.—The market is very quiet, the new demand being only for small lots. Specifications against contracts are not coming in at a satisfactory rate, a good deal of tonnage being held up. We quote Bessemer rods at $28 to $28.50 and open hearth and chain rods at about $28.50, Pittsburgh.

Muck Bar.—We do not hear of any new demand, consumers being pretty well covered for some time ahead. Local makes of best grades of muck bar, made from all pig iron, are held at about $30, delivered, buyer's mill, Pittsburgh, while Eastern muck bar is being offered here at $29 or less, delivered.

Steel Rails.—A number of small contracts for standard sections have been closed, but the expected large orders from the leading railroad systems have not yet developed. New demand and specifications against contracts for light rails have fallen off, actual sales made by the Carnegie Steel Company last week having been much the smallest for some time. This company reports a sale of 800 steel railroad ties to a leading road. Quotations on light rails are now as follows: 12-lb. rails, 1.25c.; 16, 20 and 25 lb., 1.21c. to 1.25c.; 30 and 35 lb., 1.20c., and 40 and 45 lb. 1.16c. These prices are f.o.b. at mill, plus freight, and are the minimum of the market on carload lots, small lots being sold at a little higher price. We quote standard sections at 1.25c. per pound.

Plates.—While the new demand is fair, no large jobs involving heavy tonnages are in the market. No important contracts for steel cars have been placed, and expected inquiries from leading roads that have been talked about a good deal lately have not developed. Specifications against contracts so far this month have been running about the same as in October. We quote ¼ in. and heavier plates in the wider sizes at 1.40c., Pittsburgh, but on the narrow sizes two or three mills are naming 1.35c., Pittsburgh, on attractive orders.

Structural Material.—Inquiries have been much better in the last week or ten days, a number of leading railroads figuring on bridge work that will require a very heavy tonnage. The McClintic-Marshall Construction Company has taken 1700 tons for a ferry house for the Pennsylvania Railroad at Cortland street, New York. Bids have gone in on 4000 tons of steel for the East Cambridge, Mass., extension of the Boston Elevated Railway Company, and bids will go in December 1 for 6600 tons for the New York City Post Office. The Riter-Conley Mfg. Company has taken a steel building, about 1500 tons, instead of 800 tons as reported last week, for the Oil Well Supply Company. We continue to quote beams and channels up to 15-in. at 1.40c., f.o.b. Pittsburgh.

Sheets.—There is a fair amount of new inquiry for both black and galvanized sheets for delivery in first quarter, and the mills are reported as having more actual tonnage on their books at present than at any time for several months. Prices are being well maintained, with the exception of several points of delivery on which concessions of not over $1 a ton are somtimes made. The market on sheets is on the basis of 2.20c. for No. 28 one pass black sheets and 3.20c. for No. 28 galvanized. The full schedule of prices in effect on black and galvanized and on roofing sheets is given on a previous page.

Tin Plate.—The improvement in demand for tin plate, noted in this report last week, has continued, and the leading interest has been obliged to start a number of hot tin mills that were closed down several weeks ago. Some heavy contracts for bright plate have been closed, deliveries run-

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ning into first quarter and in some cases through first half of next year. Specifications against contracts are coming in at a fairly satisfactory rate, but are not as heavy as some time ago. Prices are reported as firm, and we continue to quote 100-lb. cokes at $3.60 per base box, f.o.b. Pittsburgh.

Bars.—Several of the leading steel bar mills state that specifications against contracts so far this month show a slight increase over the same period in October. There is a fair amount of new demand, but mostly for small lots to cover current needs. Prices are firm, 1.40c. on steel bars being absolute minimum. The new demand for iron bars is light and specifications against contracts are not satisfactory. We quote steel bars at 1.40c. and common iron bars at 1.40c. to 1.45c., f.o.b. Pittsburgh.

Hoops and Bands.—Several large consumers of both hoops and bands are reported as having inquiries in the market for their supply for first quarter and first half of next year. Specifications against contracts are coming in at a fairly satisfactory rate, but are not as heavy as they were some time ago. Prices are reported as being well maintained. We quote hoops at 1.50c. in large lots, and 1.55c. in small lots; bands, 1.40c. in carload and larger lots, and 1.45c. in small lots, the latter carrying extras as given in the steel bar card dated September 1, 1909.

Cotton Ties.—The season is pretty well over in this product, only a few small orders coming in, and specifications have been pretty well cleaned up. The price of cotton ties for November shipment is 77½c. per bundle.

Spikes.—Some new inquiry is in the market for fair sized lots of railroad spikes from two of the Western roads, and it is believed that considerable business will be closed up between now and January 1, for delivery in first quarter and first half of next year. The new demand for small railroad and boat spikes is light, and is only for small lots to cover actual needs. We understand that some low figures are being made on railroad spikes for delivery in Western territory. We quote standard sizes of railroad spikes at 1.50c. to 1.55c. for Western shipment and 1.55c. to 1.60c. for local trade. We quote small railroad and boat spikes at 1.60c. to 1.65c., base, in carload and larger lots.

Rivets.—A meeting of rivet manufacturers was held in New York last week, at which regular prices of 1.90c. for structural and 2c. for boiler rivets were reaffirmed. We are advised these prices are being rigidly held. The expected better demand for rivets has come, more business now being placed than for some time.

Spelter.—The high prices ruling for some time are still being maintained. On Monday, a sale of 100 tons was made at 5.90c., East St. Louis, equal to 6.02½c., Pittsburgh.

Merchant Steel.—One prominent mill reports that its specifications against contracts so far this month have been slightly in excess of the same period in October. The general new demand, however, is quiet and is confined to small lots to cover actual needs. There does not seem to be any desire among consumers to contract. We quote, f.o.b. Pittsburgh: Iron finished tire, 1½ x ½ in. and heavier, 1.40c., base, under these sizes, 1.55c.; planished tire, 1.60c.; channel tire, 1.80c., base; toe calk, 1.95c.; flat sleigh shoe, 1.55c.; concave or convex, 1.75c.; cutter shoes, tapered or bent, 2.25c.; spring steel, 2c.; machinery steel, smooth finish, 1.90c.

Shafting.—Specifications against contracts are coming in at a little better rate, but the new demand is still confined to small lots to cover actual needs. The automobile makers are taking in more shafting at present than they have for some time, but the implement trade is not specifying very freely. It is stated that regular discounts are being fairly well maintained, and are 55 per cent. off in carload and larger lots, and 50 per cent. off in small lots, delivered in base territory. On desirable contracts and for large lots 55 and 5 per cent. is being named.

Wire Products.—The new demand for wire nails and other wire products is only fair, being confined to small lots to cover actual needs. Neither distributers nor consumers of wire products seem disposed to contract ahead, but are content to place such orders as they actually need for current requirements, or to maintain a complete assortment of stocks. It is now the off season in the wire trade, but a better demand for both wire nails and wire is expected soon after January 1. The demand from the South usually opens up in the latter part of December, and some heavy contracts from this section are looked for in the near future. The favorable weather has allowed the farmers to go ahead with fence building later than usual this year, and shipments of fence wire by the mills have been fairly heavy. We quote galvanized barb wire at $2; painted, $1.70; annealed fence wire, $1.50; galvanized, $1.80; wire nails, $1.70, and cut nails, $1.60, in carload and larger lots, all f.o.b. Pittsburgh, freight to destination being added.

Merchant Pipe.—No large inquiries for line pipe for gas or oil lines are in the market, but the project of the Busch-Everett syndicate to pipe gas from Shreveport, La., to St. Louis is again active; while this contract may not be placed for some months, it is in such shape that it may come out at any time. A party of bankers went over the ground recently with a view of financing the project. This job, if it goes through, will take about 450 miles of 20-in. pipe. The general demand for merchant pipe is fair, but is now showing a falling off, December, January and February usually being the dull months in the year in the pipe trade. Regular discounts on both iron and steel pipe are reported as being well maintained.

Boiler Tubes.—Some nice contracts have been recently placed by the railroads for charcoal iron tubes, deliveries running through first quarter. For merchant tubes the demand is light. Prices on both iron and steel boiler tubes have been somewhat demoralized for some months and do not show signs of early strengthening.

Iron and Steel Scrap.—Not much new business is being placed by consumers. The end of the year is approaching when the mills take inventory and close up the year's business, and naturally they will take in as little material as possible. The new demand for heavy steel scrap, cast iron borings, turnings and low phosphorus melting stock is fairly active, but the other grades are very dull. We note sales of 2500 to 3000 tons of borings on the basis of about $8.25 per gross ton, f.o.b. cars Pittsburgh; about 2000 tons of turnings at $9; 500 tons of heavy steel scrap at $14.50 delivered, and upward of 3000 tons of low phosphorus melting stock, running 0.04 or under in phosphorus, on the basis of $17.25 per gross ton, f.o.b. cars Pittsburgh. Dealers quote about as follows, per gross tons, f.o.b. cars Pittsburgh or elsewhere as noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$14.25 to $14.50
No. 1 foundry cast	13.50 to 13.75
No. 2 foundry cast	13.00 to 13.25
Bundled sheet scrap, at point of shipment	9.00 to 9.50
Rerolling rails, Newark and Cambridge, Ohio, and Cumberland, Md.	16.25 to 16.50
No. 1 railroad malleable stock	13.00 to 13.25
Grate bars	11.25 to 11.50
Low phosphorus melting stock	17.25 to 17.50
Iron car axles	24.00 to 24.50
Steel car axles	20.25 to 20.50
Locomotive axles	24.50 to 25.00
No. 1 busheling scrap	12.25 to 12.50
No. 2 busheling scrap	8.75 to 9.00
Old car wheels	13.75 to 14.00
Sheet bar crop ends	15.75 to 16.00
Cast iron borings	8.00 to 8.25
Machine shop turning	8.75 to 9.00
Old iron rails	16.00 to 16.25
No. 1 wrought scrap	14.50 to 14.75
Stove plate	11.50 to 11.75
Heavy steel axle turnings	10.25 to 10.50

Coke.—The item of interest in the coke trade just now is the effort of a number of the leading independent producers of coke to form a Central Selling Agency. This has been under way for some time, and has been figured out to have operators controlling about 8,000 ovens sell their coke to one buyer at any $2.25 per net ton at oven, this buyer in turn to sell the coke to consumers. A meeting to complete this project was called originally to be held in this city, November 23, but has been postponed until a later date, as some of the details have not been arranged. At present the coke trade is in very unsatisfactory condition, there being a large overproduction, and a good deal of coke is being sold at lower prices than it can be made. There is some heavy inquiry in the market for furnace coke for next year, and within a week or two several large contracts will likely be closed. A local coke producing interest recently closed with a large consumer of coke in the Wheeling district, covering his entire supply for two years from January 1, on a sliding scale, based on the price of basic iron, or in other words the consumer of the coke pays for it on the basis of eight tons of coke for a ton of basic iron. A Mahoning Valley consumer is also in the market for a large tonnage of furnace coke for delivery over first half, and this will also likely be closed on a sliding scale, based on the price of basic iron. An Eastern consumer of blast furnace coke is also figuring on his supply for first half. There is a fair amount of inquiry for foundry coke. Prices on both furnace and foundry coke, especially for prompt delivery, are running very low. We quote standard makes of furnace coke for prompt shipment at $1.45 to $1.50 per net ton at oven, while for delivery over first half of next year $1.70 to $1.75 is being quoted. Standard makes of 72-hour foundry coke are about $2 per net ton at oven for prompt shipment, while for first half quotations run all the way from $2.10 to $2.50. The output in the Upper and Lower Connellsville regions last week was 327,860 net tons, a falling off over the previous week of nearly 13,000 tons.

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W. S. Boyd, formerly purchasing agent for the Page Woven Wire Fence Company, at Adrian, Mich., and Monessen, Pa., and later assistant purchasing agent of the Pittsburgh Steel Company, is now connected with the Ohio Iron & Metal Company, iron and steel scrap, Farmers' Bank Building, Pittsburgh, his title being assistant district manager. H. D. Stalnaker is district manager of the Ohio Iron & Metal Company.

Chicago

FISHER BUILDING, November 23, 1910.—(*By Telegraph.*)

There is an improvement in the general demand for steel which is indicated by the large number of orders for small lots from store. The railroads are relaxing to a slight degree their restrictions on current purchases. A few weeks ago their orders for bar iron were limited to 100 tons for prompt shipment, but inquiries have come out from railroads the past week for several lots of 500 to 1000 tons each. While this is a small item in general trade conditions, it indicates that the situation is improving. Activity in structural contracts have been confined to the Pacific Coast for several weeks, but in the near West a large amount of business is pending. In Chicago plans for several large buildings which will require 25,000 tons of steel are held up awaiting action by the City Council on a new building code. Important developments may also be expected in railroad projects in the near future. The railroads are slow in coming forward with inquiries for steel cars, and may not come into the market until severe weather increases the car shortage to a degree that will force action. While new buying is light, prices are firm on bars, structural shapes and plates. There is sharp competition for sheet business, with a fair amount of new orders. Specifications for wire products are falling off somewhat, after an active fall season. The scrap market maintains about the same level of values that has prevailed for three or four months. There are large stocks which must pass into the hands of consumers before the dealers can obtain higher prices. Consumers of copper and other metals are buying only for prompt shipment.

Pig Iron.—Buyers have been taking more interest the past week in Southern iron for first quarter and first half delivery, and a fair tonnage has been sold by the furnaces. A local manufacturer has bought 4500 tons, principally Southern. An electrical interest has purchased 1000 tons of high silicon Southern and several implement manufacturers have purchased lots of 1000 to 2000 tons for first half. A considerable amount of iron has been sold in lots of less than 1000 tons. An unusual amount of business has been done in Southern iron running 3 per cent. and upward in silicon, on which prices are weak and the usual differentials are not maintained. Special prices are also made on round lots of silvery iron. There are not so many inquiries for Northern iron for first half as there were a week or two ago, and the larger buyers seem to have reverted to some extent to the plan of purchasing smaller lots for prompt shipment as they have done the past six months. The furnaces seem to favor this policy, as they figure that the market cannot go lower, while a large demand, which would raise prices, is still a possibility. There are several inquiries for round lots of malleable Bessemer pending for first half delivery, which have not been closed. The market for charcoal iron is quiet, but the furnace interests decided recently not to authorize any reduction. The most favorable indication in the Northern market is that prices in the valleys are reported firmer. A local buyer who had an option on 5000 tons of basic from a Valley furnace at $13 recently attempted to secure an additionay 2500 tons at the same price, but could not do better than $13.25. The following quotations are for November and December shipment, Chicago delivery:

Lake Superior charcoal	$18.00 to $18.50
Northern coke foundry, No. 1	16.50 to 17.00
Northern coke foundry, No. 2	16.00 to 16.50
Northern coke foundry, No. 3	15.75 to 16.00
Northern Scotch, No. 1	17.00 to 17.50
Southern coke, No. 1	15.85 to 16.35
Southern coke, No. 2	15.35 to 15.85
Southern coke, No. 3	15.10 to 15.60
Southern coke, No. 4	14.85 to 15.35
Southern coke, No. 1 soft	15.85 to 16.35
Southern coke, No. 2 soft	15.35 to 15.85
Southern gray forge	14.60 to 15.10
Southern mottled	14.60 to 15.10
Malleable Bessemer	16.00 to 16.50
Standard Bessemer	17.40 to 17.90
Jackson Co. and Kentucky silvery, 6%	19.40 to 19.90
Jackson Co. and Kentucky silvery, 8%	20.40 to 20.90
Jackson Co. and Kentucky silvery, 10%	21.40 to 21.90

(*By Mail.*)

Billets.—The Chicago market is quoted at $28, base, for current lots of forging billets, but concessions are necessary on any attractive tonnage. One lot of 500 tons was sold recently at $27.

Rails and Track Supplies.—The large Western railroad systems have not yet appeared in the market with their rail specifications for 1911. Small orders which were taken last week by the leading interest in this market amounted to about 4000 tons. Quotations for light rails are revised as below to correspond with the new plan of quoting rails by the pound. We quote standard railroad spikes at 1.70c. to 1.75c., base; track bolts with square nuts, 2.25c. to 2.30c., base, all in carload lots, Chicago. Light rails, 40 to 45 lb., 1.16c. to 1.20½c.; 30 to 35 lb., 1.19½c. to 1.24c.; 16, 20 and 25 lb., 1.20½c. to 1.25c.; 12-lb., 1.25c. to 1.29½c., Chicago.

Structural Material.—Plans for several large buildings in Chicago, which will require over 20,000 tons of steel, are awaiting action by the City Council on the new building code. Among other projects the Brooks Estate will erect a large office building, leases for several floors having already been signed. A large building for the Otis Estate, a large theatre, and several other buildings are included in the prospective work. Contracts closed in the West last week amount to a little over 4000 tons. The American Bridge Company booked 250 tons for a railroad bridge for the Duluth, Mesaba & Northern at Duluth, over the St. Louis River, and 366 tons for the Union avenue bridge at Pueblo, Colo. The Northwest Steel Company of Portland, which has the contract for the Corbett Building in that city, has ordered 900 tons of steel columns from the American Bridge Company and will use 1000 tons of Carnegie beams. A contract for a club house for the Native Sons of the Golden West at San Francisco, 750 tons, has been let to the Pacific Rolling Mill Company, Bethlehem shapes specified. The general contract has been let to an Eastern interest for a plant for the Servier County Sugar Company in Colorado, 800 tons. A city engine house at Milwaukee, 100 tons, was let to the Milwaukee Structural Steel Company. We quote plain material from mill, 1.58c. to 1.63c., Chicago; from store, 1.80c. to 1.90c., Chicago.

Plates.—The Chicago mills of the leading interest received good specifications last week, amounting to about 4000 tons, for car material. A good part of this order was for passenger equipment, including material for 100 sleeping cars. The steel men in this market have no definite advices regarding car orders from Western roads. The market for plates, however, has firmed up considerably in the past month. We quote mill prices at 1.58c. to 1.63c., Chicago; store prices, 1.80c. to 1.90c., Chicago.

Sheets.—The demand for open hearth sheets continues on a fairly good basis. Although the Inland mill is not crowded, the volume of current specifications is considered satisfactory in view of the backward conditions that have been reported for some time in other finished materials. Based on the price of 3.20c., Pittsburgh, for No. 28 galvanized, in carload lots to jobbers, the differentials ruling in the Chicago market are as follows: No. 30, 3.68c.; No. 29, 3.48c.; No. 28, 3.38c.; No. 27, 3.23c.; Nos. 25 and 26, 3.08c.; Nos. 23 and 24, 2.88c.; Nos. 18 to 22, 2.78c.; Nos. 15 to 17, 2.63c.; Nos. 12 to 14, 2.48c.; Nos. 10 and 11, 2.38c. The differentials on black sheets remain unchanged. No. 10 blue annealed sheets are quoted at 1.83c., Chicago, and No. 28 black, 2.38c. Prices from store, Chicago, are; No. 10, 2.10c. to 2.20c.; No. 12, 2.15c. to 2.25c.; No. 28 black, 2.75c. to 2.85c.; No. 28 galvanized, 3.65c. to 3.75c.

Bars.—Orders from the railroads for bar iron are not so far between as they were some time ago. This is giving the rolling mills a little more tonnage and is helping out a weak spot in the market. Conditions are quiet in soft steel bars, but prices are firm on new business. We quote as follows: Soft steel bars, 1.58c.; bar iron, 1.35c. to 1.40c.; hard steel bars rolled from old rails, 1.45c. to 1.50c., all Chicago. From store, soft steel bars, 1.80c. to 1.90c.

Rods and Wire.—Cold weather is having its effect on specifications for several staple lines of wire products, especially barb wire, field fence and fence wire. Specifications from manufacturing consumers are keeping up at a good rate and some contract business has been taken for delivery through the first half. Prices have been announced on poultry netting for spring trade on a basis somewhat lower than the prices of a year ago, but about on a level with the prices which actually prevailed last spring. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.68c.; wire nails, 1.88c.; painted barb wire, 1.88c.; galvanized, 2.18c., all Chicago.

Merchant Steel.—Manufacturers continue to specify for normal quantities of steel. While automobile buying is light, the implement manufacturers at Moline and other Western cities have begun to run 12 hours a day for the winter, and the mills will be kept busy during the coming winter in supplying agricultural specialties to this trade.

Cast Iron Pipe.—The market is now between seasons and only an occasional small letting it taken by the foundries outside of routine mail orders. It is expected that several

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Northern cities will be in the market next month for round lots of water pipe for winter shipment. On current business we quote, per net ton, Chicago, as follows: Water pipe, 4-in., $27; 6 to 12 in., $26; 16-in. and up, $25, with $1 extra for gas pipe.

Old Material.—The hesitation that has appeared the past week in the market for finished materials is also apparent in the scrap market. Railroad buying of equipment and supplies has not reached the volume that is necessary to stimulate the purchase of scrap by mills or foundries. Dealers are carrying large stocks and also have a good deal of scrap in transit and their instinct enables them to locate a customer without waiting for him to appear in the market with an inquiry. There was a little activity last week in railroad malleable scrap but it has quieted down. Eastern steel mills have bought a considerable tonnage of borings in Chicago recently and this is the only item in the list that shows any tendency to advance. The open hearth steel mills have been steady buyers all fall and this has maintained the value of several other grades that were formerly not in much demand for steel mills. With magnets it is easy to handle small scrap which used to be classed as No. 2 wrought, and this has kept the market for wrought scrap on a higher basis than the demand of the rolling mills would have justified. Couplers and other special grades of steel which bring a premium when the steel foundries are active have been held steady by the demand from open hearth mills. Steel car wheels are beginning to come back from the railroads and are sold at a discount of $1.50 to $2 under heavy melting steel, as they cannot be broken and can only be used in an open hearth furnace with a large door, being classed with heavy castings and steel tired wheels. The moods of the sensitive scrap trade seem to reflect the uncertainty in the financial world, since the results of the election have been weighed and found somewhat in excess of what was anticipated. The prices quoted below are for delivery to buyers' works, all freight and switching charges paid. Sellers of scrap usually receive 50c. to $1 less in this district, owing to high switching charges. Following prices are per gross ton, delivered, Chicago:

Old iron rails	$16.00 to $16.50
Old steel rails, rerolling	15.00 to 15.50
Old steel rails, less than 3 ft	13.50 to 14.00
Relaying rails, standard sections, subject to inspection	24.00 to 25.00
Old car wheels	13.50 to 14.00
Heavy melting steel scrap	12.25 to 12.75
Frogs, switches and guards, cut apart	12.25 to 12.75
Shoveling steel	11.75 to 12.25

The following quotations are per net ton:

Iron angles and splice bars	$14.00 to $14.50
Iron car axles	19.00 to 19.50
Steel car axles	19.00 to 19.50
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	11.00 to 11.50
Springs, knuckles and couplers	11.50 to 12.00
Locomotive tires, smooth	17.00 to 17.50
No. 1 dealers' forge	10.50 to 11.00
Steel axle turnings	8.25 to 8.75
Machine shop turnings	7.00 to 7.50
Cast and mixed borings	5.00 to 5.50
No. 1 busheling	10.00 to 10.50
No. 2 busheling	8.00 to 8.50
No. 1 boilers, cut to sheets and rings	8.50 to 9.00
Boiler punchings	14.00 to 14.50
No. 1 cast scrap	12.50 to 13.00
Stove plate and light cast scrap	10.75 to 11.25
Railroad malleable	11.50 to 12.00
Agricultural malleable	10.50 to 11.00
Pipes and flues	9.00 to 9.50

Philadelphia

PHILADELPHIA, PA., November 22, 1910.

The situation is being closely watched by both consumers and producers, who are awaiting developments before coming into the market or further curtailing production. Transactions in crude materials have been smaller. Pig iron prices are irregular and some foundry grades have been sold at a concession from recent quotations. More interest is shown in steel making irons, particularly low phosphorus grades, which have been sold for extended delivery. The Eastern Pig Iron Association, which held its regular monthly meeting last week, reports the situation as practically unchanged; orders declined very slightly, while a small increase in stocks was noted, but not sufficient to affect market conditions. In finished materials the absence of any active demand continues, although a better volume of business is expected. Rail orders have been few, but car and locomotive builders are reported to be figuring on a greater amount of prospective work. A better inquiry for plain shapes, against orders for fabricated work, is reported, but the demand for heavy steel plates still drags. Steel billets are quiet. More inquiry for soft steel bars is noted, but the demand for refined iron bars still drags. Old material continues dull. There has been little movement in coke; in foundry grades prices are a trifle lower, while consumers and producers appear to be apart on ideas of furnace coke prices for next year's delivery.

Iron Ore.—The market is absolutely at a standstill. Importations at this port during the week ending November 19 aggregated 12,640 tons, valued at $48,508.

Pig Iron.—With the larger transactions in foundry iron, which have had the attention of the trade for some weeks, now practically closed, the market has become quieter, with new business confined principally to small and moderate lots on which deliveries range from near future to first quarter of next year. The largest transaction reported was for 3000 tons of No. 2 X foundry, for first quarter, at a price slightly below last week's quotations. Recent sales have brought to light a wider range of prices for foundry grades, but the tendency has been downward rather than upward. Individual conditions have much to do with quotations and, while some sellers are still unwilling to take business at less than $15.75 delivered for No. 2 X foundry, prompt or forward shipments, other makers of standard eastern Pennsylvania brands are willing to accept $15.50 delivered, if the business is of a desirable nature, and sales very close to that figure have been made for first quarter delivery, while in instances sales of less well known brands are reported at prices slightly under that price. Moderate sales are, however, still reported by some sellers at $16 delivered for No. 2 X. The cast iron pipe foundries continue in the market for low grade iron; one inquiry for 6000 tons for early 1911 delivery has come out, but no important sales have been announced. The Virginia foundry iron situation is rather complex, and there appears to be little uniformity as to prices. Quite a few moderate lot sales for first quarter shipment have been made to buyers in this territory at $13 furnace, for either No. 2 X or No. 2 plain grades, while in other instances $13.25 furnace has been done, and in the case of one or two sellers concessions from the $13 basis have been reported. Individual conditions at the different furnaces play an important part in quotations, and in the case of one of the low priced sellers it is understood that the low prices have been brought about by a cleaning up process, prior to blowing out. No movement in Southern iron is reported in this territory, which at the present price is above that of Northern brands. Forge iron is in moderate demand; rolling mills are inquiring for quantities ranging from a few hundred up to 1000 tons, but appear in no haste to close. Greater interest is being shown in the steelmaking grades, low phosphorus being the most active; one sale of 6000 tons of standard analysis iron, for extended delivery, is reported at $22.50, while negotiations are pending for several large blocks on which the delivery in instances extends throughout the next year. Small lots of off low phosphorus have also been sold for first quarter at prices slightly under those prevailing for standard analysis. Inquiry for basic iron is still before the trade, one melter, who has been in the market for several weeks, not yet having closed. One sale is reported covering 2500 tons for November-December shipment, at $15 delivered, although some sellers would no doubt be willing to accept the recent $14.75 quotation for this year's delivery, while for strictly first-quarter shipment makers' ideas are closer to $15.25. The following range of prices about represents the market for standard brands, delivered in buyers' yards in this vicinity, shipment ranging from near future to first quarter of next year:

Eastern Pennsylvania, No. 2 X foundry	$15.50 to $15.75
Eastern Pennsylvania, No. 2 plain	15.00 to 15.25
Virginia, No. 2 X foundry	15.80 to 16.25
Virginia, No. 2 plain	15.80 to 16.05
Gray forge	14.25 to 14.50
Basic	14.75 to 15.00
Standard low phosphorus	22.50

Ferromanganese.—Business in this territory is still very light, no fresh inquiries of importance having developed. Some sellers maintain quotations for 80 per cent. ferro at $39, Baltimore, but this figure could no doubt be shaded.

Billets.—The market continues along narrow lines, orders seldom exceeding a few hundred tons, mostly for early delivery. While melters are feeling around for prices for deliveries extending into next year producers show little interest in such business. For ordinary prompt lots basic open hearth rolling billets are quoted at $25.50 to $26, delivered in this vicinity, dependent on the quantity involved. Forging billets are firm at $28, f.o.b. Eastern mill, the usual extras for high carbons and special sizes being added.

Plates.—While there has been no betterment in the immediate demand, the outlook for a larger volume of business is considered favorable. Considerable locomotive and car work is being figured on, some of which is expected to develop into business before the year end. Current orders are, as a rule, small and cover only immediate requirements of consumers, the aggregate volume of business coming to the Eastern mills showing no material gain. Prices are being well maintained, the minimum quotation for carload lots being 1.55c., delivered in this vicinity.

Structural Material.—A better demand for plain shapes is reported, inquiries coming out in connection with esti-

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mates for various classes of work. There have been no developments in building work. The McCaull Company, which has the general contract for an eight-story building in Savannah, Ga., has let the contract for the steel work, some 1100 tons, to Milliken Brothers. Cramp & Co., who have the contract for the Union League addition in this city, have, it is understood, awarded the contract for the steel work, 900 tons, to the Phœnix Bridge Company. There is a fair demand for miscellaneous material and prices are well maintained at 1.55c. to 1.60c., delivered, for plain shapes, according to specifications.

Sheets.—Quite a fair volume of business has been taken by producers, and consumers are more disposed to place orders to cover them beyond the usual year end suspensions of operations at the mills. There is also some feeling around for prices for even more extended delivery, but no definite inquiry has come out. Mills now have a very fair volume of orders on their books and prices are well maintained, the following range being named by Eastern makers for prompt shipments: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.60c.; Nos. 25 and 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

Bars.—While there has been a somewhat better demand for soft steel bars, refined iron bars have scarcely been so active. For the latter class of material inquiries are small and mills are anxious for orders, and while the open quotations for refined iron bars are still about 1.37c. to 1.42c., delivered in this vicinity, they can be shaded for desirable specifications. Steel bars are comparatively firm, at 1.55c., delivered in this district.

Coke.—There has been little change in the situation. Some inquiry is pending for furnace coke for first half, but prospective buyers and sellers are somewhat apart on prices, with quotations ranging from $1.65 to $1.85 per net ton at oven. Foundry coke has been quieter, with prices tending downward, sales of moderate tonnages, delivery over the next four months, being made at $2 at oven, although other sellers hold as high as $2.35. The following range of prices, per net ton, about represents the market for delivery in this territory:

Connellsville furnace coke	$3.85 to $4.05
Foundry coke	4.20 to 4.40
Mountain furnace coke	3.50 to 3.90
Foundry coke	3.85 to 4.05

Old Material.—Very little movement is to be noted in any grade, both consumers and sellers awaiting further developments. Melters still take on odd lots of steel when they can get the material at bargain prices. Merchants pay $13.50 for small lots of No. 1 heavy melting steel, to apply on old contracts, but melters do not appear interested unless they can pick up this grade at about $13, delivered. There is no demand for rolling mill grades, buyers scarcely showing interest, even in bargain lots. In the majority of grades not enough business has been done to establish market quotations. An interesting arrival at this port during the week was a cargo of 1000 tons of steel scrap from the Pacific Coast, assigned to one of the local merchants. This was largely rails, trolley and railroad steel scrap. The following range about represents sellers' ideas of the market, delivered in buyers' yards, eastern Pennsylvania and nearby points, carrying a freight rate from Philadelphia ranging from 45c. to 1.35c. per gross ton, although buyers would probably not purchase at those figures, unless in need of material:

No. 1 steel scrap and crops	$13.50 to $13.75
Old steel rails, rerolling	15.50 to 16.00
Low phosphorus	18.00 to 19.00
Old steel axles	20.00 to 20.50*
Old iron axles	26.50 to 27.50*
Old iron rails	18.00 to 18.50*
Old car wheels	13.50 to 14.00
No. 1 railroad wrought	16.00 to 16.50
Wrought iron pipe	12.75 to 13.25
No. 1 forge fire	11.50 to 12.00
No. 2 light iron	7.50 to 8.00
Wrought turnings	8.50 to 9.00
Cast borings	8.50 to 9.00
Machinery cast	14.00 to 14.50
Railroad malleable	13.50 to 14.00
Grate bars	11.50 to 12.00
Stove plate	10.00 to 10.50

* Nominal.

Cincinnati

CINCINNATI, OHIO, November 23, 1910.—(*By Telegraph.*)

Pig Iron.—Some complaint is made that the market lacks snap. Fewer inquiries are being received. Neither are prices so firm as they were two weeks ago, this applying especially to Southern iron, it being rumored that some furnaces will now take on business running through the first quarter, on the basis of $11, Birmingham. This only applies to a few interests, $11.50 for shipment through the first half being the regular quoted price. At this figure a St. Louis firm contracted for 700 tons and two Indiana consumers booked 300 and 500 tons, respectively, of No. 2 foundry. For the same delivery an Indiana melter bought 1100 tons at $11, on the basis of No. 3 foundry analysis. Northern foundry is still quoted at $14 to $14.50, Ironton, for the first half, and several furnaces are soliciting business at the first named figure. A local manufacturer is inquiring for 500 tons of different grades of foundry iron for first quarter shipment and a central Ohio company is expected to close for about 2000 tons of Southern foundry within the next few days. Other inquiries being worked on are principally for small lots of 100 to 300 tons and customers appear very indifferent about placing orders. Malleable continues firm at $14,25 to $14.50, Ironton district. Local agencies are not discouraged over the present dullness, but state that lately business has been moving in waves and that the next few days may develop a comparatively active buying movement. For immediate delivery and for the remainder of the year, based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry	$14.75 to $15.25
Southern coke, No. 2 foundry	14.25 to 14.75
Southern coke, No. 3 foundry	13.75 to 14.25
Southern coke, No. 4 foundry	13.50 to 14.00
Southern coke, No. 1 soft	14.75 to 15.25
Southern coke, No. 2 soft	14.25 to 14.75
Southern gray forge	13.50 to 14.00
Ohio silvery, 8 per cent. silicon	19.20
Lake Superior coke, No. 1	15.70 to 16.20
Lake Superior coke, No. 2	15.20 to 15.70
Lake Superior coke, No. 3	14.70 to 15.20
Standard Southern car wheel	25.25 to 25.75
Lake Superior car wheel	22.25 to 22.75

(*By Mail.*)

Coke.—Continued dullness characterizes the local market. Some foundry coke, for spot shipment, is being sold, and a few contracts have been made with consumers who were not supplied longer than thropgh December. Furnace coke is only moving fairly well on contracts, but no new business has been closed during the past week. Spot furnace coke is quoted around $1.55, per net ton, at oven in the Pocahontas, Connellsville and Wise County fields, and contract prices are $1.65 to $1.85. Some good brands of foundry coke are obtainable in all three fields around $2, but the contract price remains about $2.25, per net ton, at oven.

Finished Iron and Steel.—This is one line in which there has been some improvement in this section lately. Structural material is moving better, and hoops and bands are in much better demand. The quotable mill price on hoops is 1.50c. and on steel bars and bands 1.40c. The warehouse price on steel bars is 1.80c. and on iron bars 1.70c. to 1.75c. Beams and channels, cut to lengths, are sold around 1.90c. warehouse.

Old Material.—No new developments are reported, and business continues very dull from both a buyer's and seller's standpoint. Prices for delivery in buyers' yards, southern Ohio and Cincinnati, are as follows:

No. 1 railroad wrought, net ton	$12.50 to $13.00
Cast borings, net ton	4.50 to 5.00
Steel turnings, net ton	6.00 to 7.00
No. 1 cast scrap, net ton	11.50 to 12.50
Burnt scrap, net ton	8.00 to 9.00
Old iron axles, net ton	17.50 to 18.50
Old iron rails, gross ton	14.50 to 15.00
Relaying rails, 50 lb. and up, gross ton	22.50 to 23.50
Old car wheels, gross ton	12.00 to 13.00
Heavy melting steel scrap, gross ton	12.00 to 12.50

An error was made in stating in a recent issue that the Eagle Furnace Company, Attalla, Ala., had blown out its blast furnace. The company advises that it has no intention of shutting down at the present time.

Birmingham

BIRMINGHAM, ALA., November 21, 1910.

Pig Iron.—The tonnage placed during the past week has been fairly attractive in the aggregate, although but a small proportion of the inquiries received resulted in sales. The difference in opinion of buyers and sellers as to the price for deliveries after January 1 is as pronounced as at the time of last report, and order book requirements for such delivery have increased but little. As a matter of fact, the transactions recorded have in practically all cases covered only such tonnage as was actually required by the melters, without any indication of speculative purposes. Evidence is seen of a disposition among the leading interests to buy heavily for next year if material concessions could be had from current quotations, a number of offers for round tonnages having been refused. It is understood that a round tonnage for prompt shipment has been accepted by a large producer at a lower price than $11, Birmingham, represents, but in that particular case it is quite probable that a slight freight advantage accounted for the concession. The price of $11, Birmingham, for No. 2 foundry is

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considered the market for shipments to cover the remainder of this year, with an additional 50c. per ton being asked by all producers for strictly first half shipments. In one or more cases it is believed that a price of $11.25 could be made to apply to shipments during December and through March, yet no such quotation has been made and no sales have been reported at such figures. The asking price of all interests for grades below No. 3 foundry is decidedly firmer than for some weeks, with gray forge and No. 4 foundry generally quoted at the same price. Offers of $9.50, Birmingham, for white iron have been refused, and forge has readily brought $10, with mottled quoted at $9.75. The aggregate of such grades as just mentioned now on furnace yards is very small and inquiries involving some 1250 tons are pending. The demand for charcoal iron continues fairly strong, and an additional 500 tons of such iron will probably be placed early in this week.

Cast Iron Pipe.—It is understood that the water pipe requirements for the city of Denison, Texas, was awarded the United States Cast Iron Pipe & Foundry Company to be furnished from one of its Southern plants, but the price has not been made public. The orders recently placed aggregate but a small tonnage comparatively, and prices received are understood to be about in line with the prices received during last week. With the exception of several lots of 100 to 250 tons to be placed within the next week or 10 days, the principal letting mentioned in recent reports is for 600 tons of gas pipe and 400 tons of water pipe at Portland, Ore. This letting will probably take place within 30 days, although specifications are already in the hands of bidders. We quote water pipe as follows, per net ton, f.o.b. cars here, 4 to 6 in., $21; 8 to 12 in., $20; over 12 in., average, $19, with $1 per ton extra for gas pipe. These qoutations are nominal and are not considered as representative of prices obtainable on large municipal contracts.

Old Material.—The sale of several small lots is reported, but prices are very much at variance and the demand is rather desultory. No additions of consequence have yet been made to dealers' stocks, but with the approach of inventory time and the usual clean-up at foundry plants dealers are more interested in that regard than formerly. We quote dealers' asking prices nominally as follows, per gross ton, f.o.b. cars here:

Old iron axles	$15.00 to $15.50
Old iron rails	13.00 to 13.50
Old steel axles	14.50 to 15.00
No. 1 railroad wrought	13.00 to 13.50
No. 2 railroad wrought	9.00 to 9.50
No. 1 country	8.00 to 8.50
No. 2 country	7.50 to 8.00
No. 1 machinery	9.50 to 10.00
No. 1 steel	11.50 to 12.00
Tram car wheels	9.50 to 10.00
Standard car wheels	10.50 to 11.00
Light cast and stove plate	8.00 to 8.50

St. Louis

ST. LOUIS, November 21, 1910.

General business conditions in this city and section are admitted to be excellent, and this is indicated in many ways, notably, for example, in an increase, both here and at Kansas City, of 10 per cent. in the bank clearings last year. week, over those of the corresponding week last year. Building operations and the demand for building material are also larger. In pig iron it would appear that buyers are quite generally ready to place their orders for next year on the basis of the present market for prompt shipment. If holders stand firm for a stiff premium for 1911 iron, it is likely that most buyers will pursue a hand-to-mouth policy. Shipments are moving fairly well, and but few requests are being received to hold them up. The manufacturers of bearing metal report business good and more doing with railroads. Collections in all lines are reported to be satisfactory. Deposits are rising in the leading banks in a marked degree.

Coke.—Most of the leading sellers report a fair degree of activity for small lots, and specifications on contract are being satisfactorily received. The only sale of importance mentioned was 30 cars of Virginia coke, for shipment over the first half. The market is barely steady, and we quote for Connellsville foundry best selection $2.25 to $2.50; wkhile second quality is offered as low as $2 per net ton, f.o.b. oven; prompt shipment and contract rule at the same figures.

Pig Iron.—The improved conditions in the pig iron market, both as respects inquiry and sales, noted the previous week, were still in evidence the past week. Nearly all the leading sales agencies report quite free inquiry, and even allowing a part to come from concerns desiring to keep posted, there is still good indication of many intending buyers, mainly for 1911 iron. A number of the inquiries previously reported are still pending, notably one for 2500 tons. Among the new inquiries are the following: 300 tons Lake Superior charcoal iron, for early shipment; 300 tons Southern basic, shipment over the first half; scattering inquiries for various grades and shipment were received by one house for 600 tons; another broker closed a contract for 1250 tons of Nos. 1 and 2 Southern foundry for shipment over the first half. A third seller's transactions for the week were, in the aggregate, 1500 tons of various kinds and shipment, with an inquiry for 200 tons of low grade iron. A leading seller reports a sale of 7500 tons of Missouri basic for shipment over the first half. Prices continue to show quite a range as regards contract iron. We quote Southern No. 2 foundry for shipment prior to New Year's, $11 Birmingham; for shipment for first quarter and first half the range is from $11.50 to $12, with doubtless some shading of these figures with some furnaces on firm offers for first quarter delivery.

Old Material.—While there was not much improvement the past week in the volume of trade from consumers, there is more inquiry. Relaying rails, light sections, are rather active, and all standard sections are in request. There was but one railroad offering on the market, that of the list of the St. Louis & San Francisco of 560 tons of miscellaneous scrap. Steel scrap is in better request than iron and prices are relatively stronger in consequence. Prices are nominally unchanged and rather weak. We quote dealers' prices as follows, per gross ton, f.o.b. St. Louis:

Old iron rails	$14.00 to $14.50
Old steel rails, rerolling	13.00 to 13.50
Old steel rails, less than 3 ft.	12.25 to 12.75
Relaying rails, standard sections, subject to inspection	24.00 to 24.50
Old car wheels	13.00 to 13.50
Heavy melting steel scrap	12.00 to 12.50
Frogs, switches and guards, cut apart	12.00 to 12.50

The following quotations are per net ton:

Iron fish plates	$11.50 to $12.00
Iron car axles	18.50 to 19.00
Steel car axles	17.50 to 18.00
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	11.00 to 11.50
Railway springs	10.00 to 10.50
Locomotive tires, smooth	16.50 to 17.00
No. 1 dealers' forge	9.00 to 9.50
Mixed borings	4.50 to 5.00
No. 1 busheling	10.75 to 11.25
No. 1 boilers, cut to sheets and rings	9.00 to 9.50
No. 1 cast scrap	11.50 to 12.00
Stove plate and light cast scrap	9.50 to 10.00
Railroad malleable	9.00 to 9.50
Agricultural malleable	8.50 to 9.00
Pipes and flues	9.00 to 9.50
Railroad tank and sheet scrap	9.00 to 9.50
Railroad grate bars	8.50 to 9.00
Machine shop turnings	7.50 to 8.00

Buffalo

BUFFALO, N. Y., November 22, 1910.

Pig Iron.—The stiffening of price schedules by furnaces in this district has been followed by a lull in the placement of orders of any considerable size, and the inquiry has also fallen off as compared with the active demand of the preceding week. Notwithstanding the dropping off in large orders, the week has shown a fairly good run of medium-sized sales, from carload to 500 ton lots, in foundry grades and malleable, with some basic. Shipments on contracts have been heavy. The advance in prices is being steadily maintained by the furnacemen, the determination evidently having been reached to refuse to accept the extremely low and unremunerative prices previously prevailing. The leading pump manufacturing concern has placed orders for a considerable tonnage of foundry grades and has further inquiries pending. There are some indications of increasing inquiry from foundries supplying the railroad trade and from electrical machinery manufacturing interests. Furnaces are busy during the closing days of the month taking in the final ore cargoes of the season. For current quarter and first quarter, 1911 deliveries, we quote as follows, f.o.b. Buffalo:

No. 1 X foundry	$15.00 to $15.50
No. 2 X foundry	14.50 to 15.00
No. 2 plain	14.50 to 14.75
No. 3 foundry	14.25 to 14.50
Gray forge	14.00 to 14.25
Malleable	14.75 to 15.25
Basic	14.50 to 15.00
Charcoal	17.50 to 18.25

Finished Iron and Steel.—Good tonnages continue to be specified on contracts in most finished lines; but in new buying both consumers and jobbers are still practicing the hand to mouth method, which has been the policy for some time, with very little buying in excess of immediate requirements, resulting in smaller aggregate placements than had been hoped for by producers and selling agencies. There was some exception in wire and wire nails, in which the new buying has been in larger quantities and prices have firmed up in this line, so that the concessions that were noticeable in the market two weeks ago have disappeared. There has also been some contracting during the week in

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tin plate and tin mill products. While sellers are hopeful for improved buying conditions before the holidays, it is not believed that there will be no general buying movement until after the first of the year. Steel reinforcing bars to the amount of 140 tons will be required for concrete work on the Mount Prospect reservoir at Binghamton, N. Y., by the Sand & Gravel Company, East Liverpool, Ohio, which has the general contract. Export trade to Canada is very good, with several large orders reported of 1000 to 1500 tons each—in bars, plates and shapes. In structural lines considerable new work is in sight. Bids are to be asked for next week for steel for the group of four buildings to be erected by the Buffalo Orphan Asylum, about 600 tons, also for a church at Syracuse, 300 tons, and for bridge work at Oswego. The steel required for the German Deaconess' Home in this city, for which figures are now being taken, will amount to 250 tons instead of 100 tons, as previously reported. The Steel Storage & Elevator Construction Company, Buffalo, has been awarded contract for the lift bridge over the Erie Barge Canal at Franklin street, Syracuse, requiring 125 tons of structural steel and 23,700 lb. of operating machinery, and is now receiving bids for the steel and fabrication. The erection work has been sublet to J. P. Wright, contracting engineer, Buffalo.

Old Material.—The demand has been very limited for most lines, with the exception of wrought scrap, cast scrap and borings, for which there was a fair inquiry at well sustained prices. Shipments on contracts are somewhat lighter. Prices are ruling about the same as last week, except for heavy melting steel, the price for which is a little weaker, due to decreased demand from outside districts. We quote as follows per gross ton, f.o.b. Buffalo:

Heavy melting steel	$12.00 to $12.50
Low phosphorus steel	17.00 to 17.50
No. 1 railroad wrought	15.00 to 15.50
No. 1 railroad and machinery cast scrap	13.50 to 14.00
Old steel axles	18.50 to 19.00
Old iron axles	23.00 to 23.50
Old car wheels	14.00 to 14.50
Railroad malleable	13.00 to 13.25
Boiler plate	10.00 to 10.25
Locomotive grate bars	10.75 to 11.25
Pipe	9.75 to 10.00
Wrought iron and soft steel turnings	6.75 to 7.00
Clean cast borings	6.75 to 7.00
No. 1 busheling scrap	11.00 to 11.75

Cleveland

CLEVELAND, OHIO, November 22, 1910.

Iron Ore.—The tonnage on Lake Erie docks at the close of lake navigation this year will break all previous records, as a result of the heavy movement during the season and the falling off in the consumption. It is estimated that such stocks December 1 will aggregate over 10,000,000 tons, as compared with 8,865,789 tons on the same date a year ago. Some of the ore firms have stopped shipments and others will be through this week, so that the shipping season is almost closed. Ore buying for next season will probably be delayed until quite late next spring, and a late opening of navigation is expected next year. We quote prices as follows: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range non-Bessemer, $4.20; Mesaba non-Bessemer, $4.

Pig Iron.—While no large transactions are pending, there is a good volume of inquiry for small lots of foundry iron for first quarter and first half. The largest sale reported is 1,500 tons of No. 2 foundry iron for first half to a central Ohio manufacturer. Of this 1,000 tons was Northern and the remainder Southern. Indications now point to a fairly active buying movement during the next few weeks by the smaller consumers in this territory, but some of the larger consumers, who have not yet covered for their first half requirements, are expected to wait until after the first of the year. Prices remain stationary, and while lower quotations are not looked for there is nothing to indicate a firmer market in the near future. This is having the effect of delaying purchases by some consumers until they can tell better what their first half requirements will be. Sales for the first half are being made mostly on the basis of $14, at furnace, for No. 2 foundry. Some shading of this price is reported for spot shipment and remainder of the year delivery. Among the larger inquiries is one from an Akron furnace manufacturer for 500 tons of No. 2 foundry for the first half. While there are reports of some shading on prices of Southern iron, nearly all producers are holding firmly to $11.50, Birmingham, for No. 2 for the first half. For prompt shipment and December delivery we quote, delivered, Cleveland, as follows:

Bessemer	$15.90
Northern foundry, No. 1	$14.50 to 14.75
Northern foundry, No. 2	14.25
Northern foundry, No. 3	14.00
Gray forge	14.00 to 14.15
Southern foundry, No. 2	15.35
Jackson Co. silvery, 8 per cent. silicon	19.05 to 19.25

Coke.—The market continues very quiet. Furnaces seem in no hurry to contract for their first half requirements, and foundries not under contract are buying spot coke as they need it. We quote standard Connellsville furnace coke at $1.50 to $1.55, per net ton, at oven, for spot shipment, and $1.75 to $1.90 for delivery through the first half. Connellsville 72-hour foundry coke is held at $2 to $2.10 for spot shipment and $2.25 to $2.50 for contracts extending through the first half.

Finished Iron and Steel.—The demand in finished lines continues rather quiet, although some of the mill agencies report a little improvement. Orders are still for small lots of material, but more are coming out for larger tonnages, few, however, being for more than carload lots. Consumers generally are ordering only for their immediate requirements and many are expected to delay ordering for stock until after the first of the year. Some manufacturers, however, who have been out of the market for some time, have about exhausted their stocks and are placing small orders to replenish them. Some of the bolt and nut manufacturers have removed suspensions of shipments on steel bars and are now taking their material in moderate quantities. Agricultural implement makers continue to specify freely. The business outlook has improved among manufacturers of heavy handling machinery and the placing of prospective orders will improve the demand from this source. Prices on steel bars and structural material are firm at 1.40c., Pittsburgh, and the leading plate producers are also adhering firmly to this price. The demand for small lots of structural material continues fairly good. No large work is expected to come out soon, but considerable is in prospect for early next year. The demand for sheets is fairly active. While some mills are holding for firmer prices, concessions of from $1 to $2 a ton are still being made on black and galvanized and $1 a ton on blue annealed. The demand for wrought iron pipe has become quite active and orders for shafting continue good. The demand for reinforcing bars is also still good. There is a good demand for light rails, and some business in small lots of standard sections is pending. The Riverside Bridge Company, Wheeling, W. Va., has taken the contract for the Dunham Road bridge, near Cleveland, requiring 400 tons of structural material. The leading interest will furnish the shapes and plates for a lake passenger boat, for which the American Shipbuilding Company recently secured the contract. About 400 tons of material will be required. The demand for iron bars is light and prices are unchanged, at 1.30c. to 1.35c., at mill.

Old Material.—There has been some activity in borings and turnings during the week. Dealers having orders came into the market to cover, and prices on these grades were advanced about 50 cents a ton. Heavy melting steel is also slightly firmer and is quoted about 25 cents a ton higher than a week ago. While the general condition of the market does not show much change and consumers are limiting their purchases to immediate needs, there is a better feeling among dealers. The only railroad list this week was from the Nickel Plate, which received bids November 21 for a small tonnage. Dealers' prices, per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails	$14.00 to $14.50
Old iron rails	16.00 to 16.50
Steel car axles	20.00 to 20.50
Heavy melting steel	13.25 to 13.50
Old car wheels	13.25 to 13.50
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	12.00 to 12.50
Railroad malleable	13.00 to 13.50
Light bundled sheet scrap	9.00 to 9.50

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$21.00 to $21.50
Cast borings	6.25 to 6.50
Iron and steel turnings and drillings	6.75 to 7.00
Steel axle turnings	8.75 to 9.00
No. 1 busheling	11.00 to 11.50
No. 1 railroad wrought	13.00 to 13.50
No. 1 cast	11.50 to 12.00
Stove plate	10.50 to 11.00
Bundled tin scrap	11.00 to 11.50

The German Iron Market

Price Cutting on Bars

BERLIN, November 10, 1910.—The market situation remains quiet, but producers are in the main satisfied with the state of business. In some sections of the trade buying has been checked by organization troubles. This is particularly true of the bar market, in which, as can no longer be doubted, price cutting is becoming rather common. Some sections of the trade, too, are affected by the winter quiet, which is now beginning. That the situation in general, however, is still pretty strong is indicated by the movement of prices at last week's trading on the Düsseldorf Exchange. Band iron was quoted at 142.50 to 145 marks against 140 to 145; heavy plates at 122 to 124 marks, against 120 to 124; and light plates at 140 to 145 marks, against 137.50 to

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142.50. All grades of pig iron remained unchanged. An advance of two francs per ton in puddling iron at Longwy, in the north of France, has attracted attention in the German market this week as a hopeful sign. The price situation in Belgium appears also to have grown steadier.

The ore market continues firm. Although the imports of ores in October were unusually heavy—1,266,000 tons, against 524,400 tons in October, 1909—furnace owners still complain of the scarcity of Swedish ores. There is an especially strong demand for the latter, and producers of iron are disposed to place orders for several years where this is possible. Shipments from the north of Spain still feel the disturbing effects of the strikes at Bilbao. There is a heavy demand for fine hematite ores. Foreign hematite of 50 per cent. commands 22 to 22.50 marks delivered on the lower Rhine. High-grade manganese ores from the Mediterranean have been contracted for, reaching to the middle of 1911, at higher prices. Domestic ores are being called for delivery at a satisfactory rate.

Pig Iron Firm, with a Record Breaking Output

The pig iron market is firm, notwithstanding the record breaking production. Germany's make in October reached 1,291,379 metric tons, being about 59,000 tons more than in September, and about 178,000 tons more than in October, 1909. The new Essen Pig Iron Syndicate has not succeeded in selling as much iron for 1911 delivery as had been expected. Many contracts had been placed before the combination was finally effected; and, besides this, not a few consumers are turning to the independent furnaces, which are selling about one mark per ton below the syndicate's prices. This latter fact has led to a considerable increase of activity at the Siegerland furnaces, which are not in the syndicate. Considerable export orders for spiegeleisen and other high-grade iron have also come in. In old material there is some irregularity in prices for some grades; but, in the main, prices are steady, notwithstanding the fact that much is coming upon the market.

In steel billets most consumers have placed their orders for the first quarter of next year, but there is still some supplementary ordering for the current quarter. Export business remains steady; some good orders for 1911 delivery have recently been taken. The active market for muck bars in England creates a demand for German goods there.

The market for commercial bars, as already intimated, has grown quieter. Little new business is offering in view of the price cutting. It is also feared that the existing price convention will break down and leave the market in a more demoralized condition than ever. In the western part of the country a big dealer is offering bars 5 marks below the convention's price; and there is much questioning as to which manufacturer is his backer. The export trade in bars is also unsatisfactory, prices having been badly beaten down by the Belgian mills. A special combination in their export business was made at the beginning of October by the chief exporting mills; but their expectations have thus far not been realized.

In plates of the various grades business is very good; the demand for ship plates begins to look up. The trade in wire rods and wire is very quiet; specifications upon order are coming in slowly, and little new business is doing.

In steel rails the principal business is for export, for which increasing orders at rather better prices have recently been taken. There is a prospect of increased requirements in light rails for minor railroads.

New York

NEW YORK, November 23, 1910.

Pig Iron.—The market is quieter and has developed no decided tendencies in the past week. Sellers in the Buffalo district have taken a firmer stand after selling rather freely for first quarter and first half of 1910, but in other districts the price basis seems little changed. Here and there a buyer is unwilling to meet some of the low prices reported, but in other quarters sales are being made at concessions. Stocks of iron in Eastern Pennsylvania increased about 11,000 tons in the past month, while orders on the books of furnaces are practically the same as at previous report. Some low priced business has been done in New Jersey, and further inquiries from that quarter are up including 1000 tons from a manufacturer of furnace castings and 500 tons from another foundry. The Lackawanna Railroad is in the market for 1500 tons for its foundry at Scranton, Pa. Buying by brake shoe interests is looked for, and the formal inquiry will probably come out this week. One other large buyer is in the market for from 500 to 10,000 tons. Virginia furnaces are still quoting $13 at furnace for No. 2 X, but little is heard in this district or in New England of Alabama or Tennessee irons. We quote as follows at tidewater: Northern No. 2 foundry, $15.75 to $16; No. 2 X, $15.25 to $15.50; No. 2 plain, $15.25; Southern No. 1 foundry, $15.50 to $16; No. 2, $15.25 to $15.50.

Finished Iron and Steel.—No significant changes have been noted in conditions during the last two or three weeks, but in that time prices have been a trifle firmer than just previously. The Carnegie Steel Company is reported to have made a reduction of about $1 a ton on structural material from store, Waverly, N. J., but this has no bearing on mill prices. The general belief is that business will gradually improve soon after the first of the year, but remain on the present level until then. The steel bar trade is taking little new business, but, of course, looks for little at this season. Specifications on contracts are not up to expectations. Plates are very quiet. Bids on the construction of battleship No. 35 will be opened December 1, and specifications for the steel for both Nos. 34 and 35 are expected shortly. No. 34 will be built in the New York Navy Yard and No. 35 by a private shipyard. In comparison with other lines, bar iron is doing fairly well. One of the leading mills reports a large order for track supplies from one of the railroads. The moderate buying movement by the railroads of bridge material continues and quite a number of small orders have been placed in the past week. The Phœnix Bridge Company took 200 tons for the Boston & Maine; the McClintic-Marshall Construction Company, 160 tons for a small bridge at Laurel, Del., for the Pennsylvania, and 750 tons for track elevation work for the Baltimore & Ohio at Chicago, leaving 650 tons still to be placed; the American Bridge Company, 170 tons for a bridge at Baltimore for the Pennsylvania, and 200 tons for the Duluth, Missabe & Northern. The New York, New Haven & Hartford is in the market for another lot of small bridges, aggregating 200 tons and the Norfolk & Western for 12,000 tons, but it will probably be a month or more before any figures are asked on the latter. Contracts for building material closed include 900 tons for the Corbett Building, Portland, Ore., taken by the American Bridge Company, and 600 tons for the Tennessee Coal, Iron & Railroad Company, taken by Charles Stewart & Co. In the market are the Baltimore Bargain House, to cover an entire block, and probably require eventually several thousand tons, although the first section to be built may take only 1500 to 2000 tons; a school building in San Francisco, about 1500 tons; a City Hall at Sacramento, Cal., 600 to 700 tons; office building and freight shed for the Southern Railroad, at Atlanta, 1000 tons; steel for the custom house and other Government buildings at San Juan, Porto Rico, and a post-office at Carbondale, Pa. Prices remain unchanged: Plain structural material, plates and steel bars, 1.56c. to 1.61c., and bar iron, 1.45c. to 1.50c., all New York. Plain material from store, New York, 1.85c. to 1.95c.

Steel Rails.—The Lackawanna Railroad recently bought 9400 tons of rails for new track, the order being divided between the Lackawanna Steel Company and the Bethlehem Steel Company. The latter company has booked 3400 tons for the Lehigh Valley, but this road has not covered its requirements for 1911 with purchases of 20,000 tons, as has been reported. The Illinois Steel Company has taken scattering orders amounting to 2500 tons and the Carnegie Steel Company has sold 500 tons to the Republic Iron & Steel Company. The Tennessee Company has sold 750 tons of standard sections to Metzger Brothers.

Old Material.—The market is exceedingly quiet. Steel works and rolling mills are not buying to any extent, while the foundries are purchasing cast scrap in small quantities only to meet their immediate requirements. Dealers' quotations, per gross ton, New York and vicinity, are as follows:

Rerolling rails	$12.00 to $12.50
Old girder and T rails for melting	10.50 to 11.00
Heavy melting steel scrap	10.50 to 11.00
Relaying rails	20.50 to 21.50
Standard hammered iron car axles	22.50 to 23.00
Old steel car axles	17.00 to 17.50
No. 1 railroad wrought	13.00 to 13.50
Wrought iron track scrap	12.00 to 12.50
No. 1 yard wrought, long	12.00 to 12.50
No. 1 yard wrought, short	11.00 to 11.50
Light iron	5.00 to 5.50
Cast borings	6.00 to 6.50
Wrought turnings	6.00 to 6.50
Wrought pipe	9.50 to 10.00
Old car wheels	12.00 to 12.50
No. 1 heavy cast, broken up	11.50 to 12.00
Stove plate	9.50 to 10.00
Locomotive grate bars	9.00 to 9.50
Malleable cast	12.00 to 12.50

Ferroalloys.—There are some good inquiries out for ferromanganese, and transactions have been made in this market at $39 seaboard, covering requirements for the first half of next year. Ferrosilicon is in decidedly good demand, and quotations are strengthening. The market is quoted at $56 to $56.50, Pittsburgh.

Cast Iron Pipe.—No important public lettings are at present in sight. More than the usual private buying, however, is in progress for spring delivery. Naturally, these

THE IRON AND METAL MARKETS

buyers include many of those who have the reputation of being the shrewdest in this branch of trade. The market for prompt delivery is still largely in the hands of those who have large stocks of standard sizes, which they are pressing for sale. Carload lots of 6-in. are therefore available at $22 or less per net ton, tidewater.

Metal Market

NEW YORK, November 23, 1910.

THE WEEK'S PRICES

Cents Per Pound.

	Copper.			Lead.		Spelter.	
Nov.	Lake.	Electrolytic.	Tin.	New York.	St. Louis.	New York.	St. Louis.
17	13.00	12.87½	36.55	4.40	4.30	5.95	5.80
18	13.00	12.87½	36.40	4.50	4.40	5.95	5.80
19	13.00	12.87½	....	4.50	4.40	5.95	5.80
21	13.00	12.87½	36.90	4.50	4.40	5.95	5.80
22	13.00	12.87½	36.85	4.50	4.40	5.95	5.80
23	13.00	12.87½	36.90	4.50	4.40	5.95	5.80

The market in all metals is strong. Lead has been advanced ten points. Copper is firm, although not in very great demand. The tin market is steady. Spelter continues strong at recently advanced prices.

Copper.—The copper market is firm. A number of heavy buyers, who have been sounding the producers with a view to making purchases of lake copper at something under 13c., were disappointed. In every instance sellers were not interested in any offers at less than 13c. As a matter of fact, the holders of all grades of copper show considerable indifference at this time, evidently expecting a better price. The position of copper at present is stronger than it has been in many weeks. Electrolytic copper cannot be had at less than 12.87½c. The London market closed to-day with spot coffee selling at £57, 12s., 6d., and futures at £58, 11s. 3d. The sales amounted to 100 tons of spot and 500 tons of futures. The market closed steady.

Pig Tin.—The pig tin market is quiet but firm. There has been no tin of any amount moving during the last week, and it appears that buyers are not in urgent need of the metal. The market has been steadier during the last week than at any time in the last three months, and although tin has gone up a little in London in the last two days, holders of stocks here failed to follow the lead of the London market. Stocks are more plentiful and better distributed and altogether the market is less sensitive. In New York this afternoon pig tin was sold for 36.90c. The London market closed with spot tin selling at £167, 15s., and futures at £167, 17s., 6d. The sales amounted to 100 tons of spot and 300 tons of futures. The market closed firm.

Tin Plates.—The tin plate market is quiet and stocks are plentiful. The strike among the sheet metal workers in New York is having an effect on trade here, and orders are being noticeably curtailed. The price of 100 lb. coke plates remains at $3.84.

Lead.—The leading interest advanced the price of lead November 18 to 4.50c., and outside sellers who have been offering the metal at around 4.45c. promptly raised their price also. Coming at this time, the advance is something of a surprise. Five months ago, when lead was in heavy demand, an advance was looked for, but for some reason the principal sellers continued to hold the New York market at 4.40c., and lead was selling here relatively cheaper than in the West. It is said that there have been some good bookings during the last two weeks. The price of lead in New York now is 4.50c., and the market in St. Louis is from 4.40c. to 4.42½c.

Antimony.—There is nothing new in the antimony market. There was some buying a week ago, but things have quieted down again. There is less talk of price cutting, however. Cookson's is quoted at 8.15c.; Hallett's at 7.75c.; Chinese brands, 99 per cent. guaranteed, are 7.40c. to 7.50c., and Hungarian grades are selling at around 7.12½c.

Old Metals.—The market is dull. Dealers' selling prices are continued, as follows:

	Cents.
Copper, heavy cut and crucible	12.50 to 12.75
Copper, heavy and wire	11.75 to 12.00
Copper, light and bottoms	11.00 to 11.25
Brass, heavy	8.25 to 8.50
Brass, light	7.00 to 7.25
Heavy machine composition	11.25 to 11.50
Clean brass turnings	8.00 to 8.25
Composition turnings	9.00 to 9.50
Lead, heavy	4.20 to 4.25
Lead, tea	3.95 to 4.00
Zinc scrap	4.30 to 4.40

Spelter.—Although there has not been a great deal of buying, prices are being upheld very firmly. Some consumers were frightened into the market during the week by rumors of a further advance, and several are said to have purchased to cover their requirements for the next six months. The call for spelter from the general trade, however, has been very light. Sales were made in New York during the week at 5.95c., and in East St. Louis the price of spelter is around 5.80c.

Metals, Chicago, November 22.—Consumers of copper are buying chiefly for prompt delivery and are not taking so much interest in future shipment as was shown a few weeks ago. Tin has bounded upward again. The leading interest in lead has marked the price up 10 points, but not as a result of any unusual demand, as this is the wrong season of the year for lead to advance. The price of spelter is very firm, but buyers do not seem active in purchasing. We quote Chicago prices as follows: Casting copper, 13c.; lake, 13⅛ c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, carloads, 37½c.; small lots, 39c.; lead, desilverized, 4.45c. to 4.50c., for 50-ton lots; corroding, 4.70c. to 4.75c., for 50-ton lots; in carloads, 2½; per 100 lb. higher; spelter, 5.90c. to 5.95.; Cookson's antimony, 10¼c., and other grades, 9c. to 10c., in small lots; sheet zinc is $7.75, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 12¾c.; copper bottoms, 10¾c.; copper clips, 12c.; red brass, 11¼c.; yellow brass, 9c.; light brass, 6c.; lead pipe, 4¼c.; zinc, 4¼c.; pewter No. 1, 24½c.; tin foil, 30c.; block tin pipe, 33c.

Metals, St. Louis, November 21.—Lead is higher and firm at 4.37½c.; spelter is active and strong at 5.90c., both at East St. Louis. Zinc ore is in demand and firmer, being quoted at $45 per ton, Joplin base. Tin is quoted at 36.70c. per pound; antimony (Cookson's), 8.45c.; lake copper, 13.35c.; electrolytic, 13.22½c., all at St. Louis. For finished metals, the demand the past week was quite good, with continued railroad buying, one company taking four carloads.

Notes on Prices

Rope.—The cordage business is jogging along in the ruts that have been worn by retarded trade. One manufacturer states that this month's trade will be less than the corresponding month of last year. Some years ago there were about three recognized grades of manila fibre. Now there are in the neighborhood of eight grades, which means that there is 12½ per cent. difference between the different qualities. This renders it difficult for any one except an expert to decide which grades are used in making any particular rope under discussion, and equally hard to tell what the rope is actually worth. Coloring manila and sisal fibers to improve their looks and make them appear to be of higher grade than they really are is sometimes indulged in. Because of this and the comparatively small difference between the different grades of fiber, the average buyer has to depend upon reputable manufacturers to be sure that he gets the grade of rope he pays for. Lower quotations on sisal fiber and competition for business have caused a lowering of prices. The following quotations represent prices to the retail trade in the Eastern market for rope 7-16 in. in diameter and larger, with card advances for smaller sizes: Pure manila of the highest grade, 8¾c. to 9¼c. per pound; second grade manila, 7¾c. to 8¼c. per pound; hardware grade, 7¼c. to 7¾c. per pound; pure sisal of the highest grade, 6¾c. per pound; second grade, 6¼c. per pound; jute rope, ¼-in. and up, No. 1, 5¾c. to 6¼c. per pound; No. 2, 5¼c. to 5¾c. per pound.

Linseed Oil.—Prices are firm and oil is difficult to obtain, even in comparatively small lots, by manufacturing consumers who continue buying in limited quantities. The season for the use of oil in painting is about closing, this being shown by the decrease in demand. The desire of Eastern crushers to obtain seed for shipment down the lakes before navigation closes November 30 has given the seed market an upward turn at Northwestern receiving points, where seed continues to arrive slowly. From this time forward is usually regarded as the dullest period of the year, but because of the small stocks in consumers' hands the demand is above what it naturally would be under normal conditions. The following quotations represent New York prices in five-barrel lots or more:

	Cents.
Out of Town, raw	97 to 98
City, raw	97 to 98

Linseed, in lots less than 5 bbl., 1 cent advance per gallon.
Boiled oil, 1 cent advance over raw.

The Harlan & Hollingsworth Corporation, Wilmington, Del., launched November 19 the steamship Northland, building for the Norfolk & Washington Steamship Company, for service between Washington, D. C., and Norfolk, Va. The vessel is 305 ft. long and 52-ft. beam, and will have a speed of 19 knots per hour.

The Machinery Markets

Business continues fairly steady in machinery selling centers, but there is no notable buying. The railroads have withdrawn from the market in the East, but in Chicago and the farther central West there are some good inquiries from that source. Business continues to improve in the Chicago market, and some attractive business is in sight there for the first of the year. There is complaint of the scarcity of skilled labor in Detroit, which should mean that a good deal of manufacturing is going on there, and a steady volume of business is being done. Conditions are unsettled in Milwaukee, but there is a good call for heavy power and water works equipment. In Milwaukee, as well as in the Eastern markets, the export business continues good. In Cleveland and in Cincinnati the machinery markets show a gradual improvement, but in both those markets the business is largely of a single tool character. There has been some good buying in the Northwest and steady improvement is shown in the Southern trade. In San Francisco and on the north Pacific coast there is an excellent demand for electrical equipment, and many machinery plants have been busy there with marine work. The shipyards on both coasts and along the Great Lakes are busy just now with winter work and are good customers for all classes of repair shop equipment.

New York

NEW YORK, November 23, 1910.

There is a noticeable absence of business in this market. Many inquiries which have been before the trade for the last few weeks have failed to materialize, and prospective buyers show great caution in placing orders. The railroads are picking up a tool here and there, but they are doing nothing of any great consequence in the purchasing line. The last railroad buying of any note done in this market was closed out by the Delaware, Lackawanna & Western Railroad for its Scranton shops, and this purchasing hardly came up to the expectations of those who had in hand the extensive list of requirements sent out by the company last May. There are plenty of inquiries out, but it is hard to tell whether many of the people asking for bids are feeling the market with a view to satisfying their curiosity or whether they actually mean business. It is a noticeable fact that when times are rather slack in the metal industries a heavy volume of curious inquiries comes before the trade. In other words, it appears that a great many people who have nothing else to do feel out the machinery market with a view to finding out how trade is. Prices in the machinery trade are being well maintained, and in the second-hand machinery line especially quotations on used machines are high. Jobbing foundries in this vicinity are fairly busy, but many foundries that make a practice of securing large contracts could take more work if it were offered. There are some lines that are especially busy. Manufacturers of automatics continue behind in their deliveries and have all the business they can take care of for six months. Manufacturers of some classes of milling machines are also a little behind in their orders, but most machine tool builders have caught up and can furnish equipment on short notice.

The New York, Chicago & St. Louis Railway Company has prepared plans for a structural steel lift bridge over the Buffalo River, at Buffalo, N. Y., to be used jointly with the Pennsylvania Railroad and submitted them to the Bureau of Engineering of the city of Buffalo for approval. This bridge will be located a short distance east of the new steel lift bridge of the Lake Shore & Michigan Southern Railroad.

The National Police Signal Company, Buffalo, N. Y., has been incorporated with a capital stock of $100,000 to manufacture signal apparatus for police departments. The directors are Augustus F. Schen, Jno. F. Nagel, Louis W. Miller, 200 Ellicott Square Building.

The Otis Elevator Company, Buffalo, N. Y., is building a fireproof testing tower at its plant on Northland avenue and Griden street and the New York Central Railroad Belt Line.

The Crosby Company, manufacturer of stamped metal work, Buffalo, N. Y., is adding a pickling building and a warehouse of brick and steel to its plant on Pratt street.

The Rochester Can Company, Rochester, N. Y., has plans in progress for a two-story brick factory building, to be erected early next spring on Hague street.

The Stecher Lithographic Company, Rochester, N. Y., is completing plans for the erection and equipment of a three-story brick addition to its plant, to cost about $50,000. Frank A. Stecher, 274 Goodman street, is president.

The Westinghouse Machine Company, Pittsburgh, was low bidder at $248,180 for three steam turbine electric generators—5000 kw. each, with jet condensers—for the new waterworks pumping station at the foot of Porter avenue, Buffalo.

The Shur-on Trolley Guard Company has been incorporated at Buffalo, N. Y., with a capital stock of $25,000, to manufacture trolley safety devices—Henry J. Tiedt, Frank J. Nolan, and Howard J. Young are directors.

The Frontier Rubber Company, Buffalo, N. Y., recently incorporated to engage in the manufacture of pneumatic and hard rubber tires, has secured a two and three story factory building at Niagara street and New York Central Belt Railroad at West Delavan avenue, formerly occupied by the Preston Hose & Tire Company, with necessary machinery and equipment and will begin manufacturing at once. Charles F. Bensing is manager.

The Victor Appliance Company has been incorporated at Watervliet, N. Y., to manufacture automobile and motorboat supplies and operate a general custom machine shop—Augustus Bigelman, Gustav Garrow, and Dewitt Tappan are directors.

The Frey Auto Supply Company has been incorporated at Buffalo, N. Y., with a capital stock of $25,000, to manufacture automobile parts and supplies—John W. Frey, 700 Main street, is manager.

The Gath Machine Tool Company has been incorporated at Buffalo to take over and continue the business of Gath & Gardner, manufacturers of and dealers in machine tools, at 61 The Terrace. The new company will also handle as agents a line of metal working and small tools, as well as electric cranes and hoists and woodworking machinery. Andrew L. Gath is president of the new company.

The Steel Storage & Elevator Construction Company, 730 Main street, Buffalo, N. Y., was low bidder for the construction of a steel lift bridge over the Erie Barge Canal at Franklin street, Syracuse; amount of bid, $38,245.

The New York Central Railroad contemplates expenditures for improvements at Utica aggregating $2,000,000, including yard extensions, freight houses, and a new passenger station, the latter to cost $500,000.

The Consolidated Casting Company has been incorporated at Mechanicsville, N. Y., to manufacture castings of all kinds—Arthur H. Trumbull, Syracuse, and R. V. Tompkins, Mechanicsville, N. Y., are among the incorporators. The capital stock is $20,000.

Business Changes

The De Laval Steam Turbine Company, Trenton, N. J., announces that the Dravo-Doyle Company, by whom it has heretofore been represented in Pittsburgh, Philadelphia and Cleveland, will open an office in Chicago at Marquette Building in charge of H. S. Budd.

The American Woodwork Mfg. Company has succeeded the business of the New York Dimension Supply Company, and will continue to manufacture at its plant at Evansville, Ind., plumbers' wood work and table stock.

Chicago

CHICAGO, ILL., November 22, 1910.

The improvement in the machinery trade continues and encourages the expectation of a larger volume of business this winter. There are more inquiries from the general trade from the class of buyers who purchase one or two tools at a time, and there are also good inquiries from large corporations which find it necessary to increase their facilities. Some very attractive business has appeared in the market, which will not be closed until after the first of the year, but this is not far in the future now, and dealers are glad

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to see inquiries of this character which will afford them a substantial beginning for the new year. There is a fairly steady demand for used tools. In smaller tools and specialties the trade has been fairly good throughout the past year. The improvement at the present time is more pronounced in the heavier tools, which run into higher prices. There are several good inquiries from railroads which are not putting out large lists. The gasoline engine manufacturers are prosperous and are making many additions to their equipment. The agricultural implement people are unusually busy for this season.

The Wastemo Chemical Company, Springfield, Ill., has increased its capital stock from $5000 to $100,000, and will erect a new building, for which battery machines, mixers, label compounders, &c., will be purchased.

Orton & Steinbrenner, Chicago, will erect at Huntington, Ind., a factory building, 80 x 160 ft., mill construction, to be operated by electric power. The company manufactures locomotive cranes. It is understood that a considerable amount of new equipment will be installed.

The Brunswick-Balke-Collender Company, Chicago, has recently looked over a number of towns with a view to erecting a factory, but advises that a definite location has not been decided upon and probably will not be selected for some time.

The Electric Cleaner Company, Chicago, will move to Des Moines, Iowa, and will hereafter be known as the Wilson-Des Moines Electric Cleaner Company. The company has secured temporary quarters, which will be occupied until a new factory building can be erected. The company manufactures vacuum cleaners, and will be under the active management of Lucius and Samuel Wilson of the Wilson Machine Company, Des Moines.

The Northern Illinois Light & Traction Company, comprising the lines of the McKinley system, has awarded to the L. E. Myers Company, Railway Exchange Building, Chicago, a contract for building a hydroelectric plant at Marseilles, Ill., at a cost of $300,000. The traction company has secured from the Marseilles Land & Water Power Company a contract for the use of all surplus power in the Illinois River, amounting to several thousand horse power, which will be used to operate the interurban systems, which will start out from or be connected in any way with this section of the State. There will be installed 12 vertical turbine water wheels in individual flumes and supported on suspension roller bearings. It is believed that this plant will be of sufficient capacity to supply all the power needed for the lines in northern Illinois, and substations will be installed through which the power will be distributed to the lines as it is desired. High tension lines will be run from the main plant to the substations, and the smaller plants will be controlled by automatic devices from the main plant, thus equalizing the power all along the line.

The Pekin Garage & Outing Company, Pekin, Ill., has been incorporated, with a capital stock of $5000. The incorporators are Walter E. Green, Herman Kaemmerling and William Kaemmerling. The company will engage in manufacturing and repairing automobiles.

The Joliet Rolling Mill Company, Joliet, Ill., has been incorporated, with a capital stock of $150,000. The incorporators are T. F. Donovan, J. L. O'Donnell and J. A. Bray.

The Elgin Giant Case Watch Company, Elgin, Ill., has been incorporated, with a capital stock of $25,000. The incorporators are Walter Bachrach, Chas. J. Wendland and S. Sidney Stein.

The Meadows Sheet Metal Works, Meadows, Ill., has been incorporated, with a capital stock of $15,000. The incorporators include Edwin Whorrell, D. N. Claudon, R. L. Rathbun.

The Richards-Wilcox Mfg. Company, Aurora, Ill., certifies to an increase in capital stock from $124,000 to $800,000.

Philadelphia

PHILADELPHIA, PA., November 22, 1910.

Transactions reported during the week by both manufacturers and merchants indicate that there has been no change in the demand in this territory. Occasionally an order for a few tools is placed, but there is not enough business of this class to go around, and gains by such orders have hardly been sufficient to bring the aggregate volume up to a fair average. The railroads still show no real interest in the market. Machine tool builders report unchanged conditions, orders coming in irregularly and in many instances hardly filling up the gaps made by deliveries on old orders. There is a trifle better demand for special machinery and equipment in diversified lines.

Second-hand machinery merchants report the demand as a trifle less active, but fair when the general trade situation is taken into consideration. A moderate inquiry for second-hand power equipment is noted, but the demand for engines and boilers of the larger capacities has not been particularly active.

The demand for tools, machinery and general equipment for export continues rather dull.

The fact that the large industrial establishments are operating, for the most part, at a productive rate not over 50 per cent. of their capacity retards business from a class of trade which is usually comparatively good buyers of machine tool and machinery equipment.

The wagon, truck and carriage works of H. Kaiser & Co., Twenty-third and Race streets, was partially destroyed by fire on November 17, at a loss of $25,000 to $30,000. The burned portion of the plant will be rebuilt at once. Considerable damage was done to the equipment, and purchases of woodworking tools and machinery and power transmission equipment will have to be made.

An application for a charter for the South Penn Railway & Light Company, with a capital stock of $4,500,000, has been filed with the County Clerk of Camden, N. J., under the laws of the State of New Jersey. V. A. Murray, D. Billinger, and J. R. Bradley, of Pittsburgh, Pa., are named as the incorporators.

The Pennsylvania Equipment Company, West End Trust Company Building, is in the market for a number of 30-ton box cars, three trailer cars, and three motor cars of the semi-convertible type. Second-hand equipment is preferred.

Ballinger & Perrot, engineers, have bids in hand for a power house and tank tower to be erected at Forty-fourth and Thompson streets, for Chalfant Brothers. The building will be two stories and contain provisions for an engine and two boilers. The engine to be installed is already in hand, but boilers and minor equipment are yet to be purchased.

Frank Toomey reports the demand for second-hand machinery and tools a shade less active, but might be considered fair when the general trade condition is taken into consideration. He has just purchased a complete automobile manufacturing plant and will endeavor to sell it entire or dispose of the various tools and equipment separately.

A slight fire in the bolt department of the Lebanon Valley Iron & Steel Company, Lebanon, Pa., was reported last week, but the damage was insignificant and will in no way interfere with the operation of the plant.

The Crucible Steel Casting Company, Lansdale, Pa., will install an 8-ton electric melting furnace, furnished by the American Electric Furnace Company, 45 Wall street, New York. An engine and General Electric Company generator have been purchased to supply power for the furnace, which is to be ready for operation by February.

Plans are under way for the formation of a company to be known as the East Greenville Wooden Novelty Company, with a capital stock of $10,000, to erect and operate a plant for the manufacture of washing machines and wooden novelties at East Greenville, Pa. The major portion of the capital stock is already subscribed.

The Philips Pressed Steel Pulley Company has recently established an agency for the sale of its pressed steel pulleys with the Techniche Handlungs Gesellschaft, in Vienna, Austria. This company reports a good export demand for pulleys, particularly from Australia, France and India. The domestic demand is most active on the Pacific Coast and in the middle West. Business generally continues fair and the various departments of the plant are averaging about 70 per cent. of full capacity.

The City Council of Wilmington, Del., is considering the advisability of the installation of a municipal lighting plant. It is said that the Water Department had sufficient water power at its disposal for use in connection with such a plant.

In the Common Pleas Court, Lebanon, Pa., decrees of foreclosure and sale have been announced in the proceedings brought by the Valley Trust Company, of Palmyra, as trustee for the bondholders, against the Lebanon Chain Works, Lebanon, Pa., and the Farmers Trust Company, Lebanon, Pa., trustee for the bondholders of the West End Iron Works of that city. The order states that no bid under $20,000 shall be accepted. The time of holding the sale is left to the trustees, S. P. Light and C. H. Killinger. These transactions are in connection with the receivership of the late Iron & Steel Products Company.

The Nazel Engineering & Machine Works reports a very satisfactory demand for Béché patent pneumatic forge hammers, of which it is the sole manufacturer for the United States and Canada. One of the 250 lb. type, with motor drive, forging up to 5 in. stock, has just been furnished the Baldwin Locomotive Works. These hammers are built in six sizes, from 66 to 770 lb. ram weight, the latter size having a capacity of forging 9 in. stock. The Nazel Works

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is also busy on special machines for spring forming and on special paper machinery. This concern now has under consideration the erection and equipment of a forging plant to be operated in connection with its machine department.

A prospective purchaser, who is not yet prepared to announce the details in connection with the project, is in the market for the following new or second-hand equipment: Three 250 hp., water tube boilers, 160 lb. steam, or equivalent in hp., with stack, feed pump, heater, &c.; one simple, non-condenser Corliss engine, 25 to 30 in. diameter, 48 to 52 in. stroke, fly-wheel 90 rev. per min., 140 lb. steam; one, any type, simple non-condenser, direct connected to 125 or 150 kw. generator, 250 V. D. C.; two 10-ft. diameter gas producers complete; one 20 to 24-in. rolling mill, three-high rolls, two stands, complete with housings, pinions, couplings, &c., set of power driven feed rollers for runway; roll lathe; one track scale, 100-ton complete; one shallow throat standard punch, motor driven, capacity 2-in. hole through 1-in. plate; one 5 to 10 ton traveling crane, 3 motor, 220 V. D. C., 80-ft. span; 800-ft. I-beam runway, rails, &c. Communications are to be addressed to Box 240, care *The Iron Age*, Philadelphia.

Cleveland

CLEVELAND, OHIO, November 22, 1910.

The general outlook in the local machinery market shows an improvement. The outlook for a better volume of business in heavy machinery is particularly promising. Good inquiries have come out during the past few days for ore and coal handling machinery, gas producers and other steel plant equipment and hydraulic turbines. These in nearly all cases are good live inquiries that are expected to result in the placing of orders without much delay. Makers of some lines of machine tools also report more business in prospect than for some time. The statement has been frequently made that the machine tool market in northern Ohio and adjacent territory has not got back to its normal condition since 1907, the bulk of the activity since that time being in a demand for machinery used directly or indirectly in the manufacture of automobiles. An indication that a more general buying is now in prospect is shown by the statement of a local manufacturer of drilling machinery to the effect that his company now has more general inquiries than at any time during the past three years. These are mostly for the heavier type of machines, for which the demand has been light, sales to the automobile manufacturers having been confined almost entirely to the lighter drills.

Business with the local machine tool dealers shows some improvement in the volume of orders, but they are mostly for single tools in small sizes. The most of this business is coming from small machine shops. Few orders are coming from large manufacturing plants. There is a fair demand for second-hand machinery.

The Superior Drop Forge & Mfg. Company, which is building a new plant in Cleveland, placed an order during the week for the greater part of its machine shop equipment. The company has completed its organization by the election of the following officers: W. H. Lucas, president; F. V. Eurich, vice-president and general manager; and C. H. Walker, secretary. The company expects to buy 12 steam hammers.

The Adams-Bagnall Electric Company has purchased the plant and business of the Jandus Electric Company in Cleveland and will move the equipment of the latter company to its own plant. The Adams-Bagnall Company will add to its present line the manufacture of electric fans, which have been one of the products of the Jandus Company.

The Stuyvesant Motor Car Company has bought out the Gaeth Company of Cleveland, which recently went in the hands of a receiver. The Stuyvesant Company has acquired the plant of the Warren Mfg. Company, at Sandusky, Ohio, which is being fitted up for the manufacture of automobiles.

The Norwalk Drilling Tool Company, Norwalk, Ohio, has been incorporated with a capital stock of $10,000 by Edgar G. Martin, E. O. Boughton, G. P. Hogan, and C. P. Venus.

The Mineral Ridge Mfg. Company, Mineral Ridge, Ohio, has increased its capital stock from $5,000 to $50,000, and, it is reported, will enlarge its plant. The company makes miners' supplies.

The D. C. Mfg. Company, Canton, Ohio, maker of plumbers' supplies, which is building a new plant, has increased its capital stock from $40,000 to $75,000.

The Buckeye Aluminum Company will soon begin the erection of a new plant in Wooster, Ohio.

The Vim Motor Company, Sandusky, Ohio, which recently increased its capital stock from $25,000 to $60,000, has just completed a new factory building 80 x 132 ft.

The Bauroth Machine Company, at present operating a shop at 454 Earl street, Toledo, Ohio, has acquired a site along the Lake Shore Railroad, near Dorr street, in that city, and will build a new plant for the manufacture of dies and drill presses. The officers of the company are Leonard Bauroth, president; August Bauroth, vice-president, and Henry Stautzenbach, secretary.

George D. Claflin has purchased a vacant pottery building in Lancaster, Ohio, which, it is reported, will be fitted up for the manufacture of wood fibre machinery.

The Troy Wagon Works, Troy, Ohio, maker of dump wagons and other vehicles, will build a $12,000 addition to its plant.

The Bay View Foundry Company, Sandusky, Ohio, has let contract for an addition to its core room.

Cincinnati

CINCINNATI, OHIO, November 22, 1910.

Both machine tool builders and dealers report a slack business in the larger sized tools, but the smaller ones have been fairly good sellers during the past few days. Business men generally did not expect any great improvement to take place immediately after the elections, but they anticipate a gradual upward trend in every line, and some predict the opening of spring will show general conditions above normal. The continued absence of railroad orders has convinced most of the trade that it is bad policy to look entirely to any one particular industry for support. Local bankers report money rather tight, but some of them state this is due largely to the call for funds from Kentucky banks to handle the tobacco crop.

The foundries are only fairly active, and the majority of them do not look for any change until after January. Second-hand machinery appears to have dropped back in the rut again and no sales of consequence can be reported for the past week.

Boiler makers are among those who anticipate a satisfactory spring business. Many municipal water works plants are planned and there are quite a number of inquiries already being figured on, in a tentative way, for equipment to be installed in large manufacturing plants. The sale of small boilers and engines is somewhat curtailed by the almost general use in this vicinity of internal combustion engines, using natural gas.

Secretary Manley of the Cincinnati branch, National Metal Trades Association, has issued a circular letter to all members urging a full attendance at the meeting to be held at the Business Men's Club, December 8. The following speakers will address the gathering: J. F. Deems, superintendent of motive power, New York Central Lines; William Hodgdon, freight traffic manager, the Pennsylvania Lines; D. C. Buell, director, bureau of education, Union Pacific Railroad, and W. H. Taylor, treasurer and general manager of the David Williams Company, publisher of *The Iron Age*. A large number of manufacturers in other cities will attend, and all local members are expected to be present.

The new plant of the Bahmann Iron Works Company, Winton place, Cincinnati, has been completed and is now occupied. The company's output will be greatly increased.

The Gramm Motor Truck & Car Company has nearly completed its plant at Lima, Ohio, and announces that operations will commence in January. About 400 men will be employed, which number will be increased as occasion demands.

Plans have been completed for additions to the plant of the Jewell Carriage Company at Carthage, Ohio, recently mentioned. The company recently increased its capital stock from $250,000 to $400,000.

The plant and business of the Cincinnati Chuck Company, Colerain avenue, Cincinnati, has been sold to New England capitalists, and it is understood that the machinery will be moved to a new location in Massachusetts.

It is stated that the Cincinnati Traction Company will commence work at an early date on new car shops to be erected in Winton place, Cincinnati.

The capital stock of the United States Electrical Tool Company, Cincinnati, has been increased from $25,000 to $100,000. The company has completed the foundations for its new plant, but has decided to postpone further work on it until early next spring.

The Hardin-Wyandott Lighting Company has been incorporated at Kenton, Ohio, with $10,000 capital stock, by W. B. Whiting, C. C. Owens, Sterling Newall, Ellis R. Diehm, and Donald McBride.

The Troy Foundry Company is a new incorporation at

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Troy, Ohio, with $10,000 capital stock. The incorporators are J. W. Merkle, Jacob Lust, L. H. Shipman, G. Miller, and Louise E. Eichts.

The E. H. Huenefeld Company, Cincinnati, has purchased the good will, patents and plant of H. Franke, Cleveland, Ohio, and will operate the factory at that point for the manufacture of metal specialties.

The capital stock of the Jas. R. Shanklin Coal Company, Cincinnati, has been increased from $150,000 to $175,000. Some extensive improvements at its mines in the Pocahontas field, are contemplated for next year.

The John B. Morris Foundry Company, Cincinnati, is working on an order for several Schellenbach lathes to be shipped to Austria.

Excellent weather conditions have enabled the American Rolling Mill Company to push work on its new mill at Hamilton, Ohio, and it will probably be completed ahead of the scheduled time.

Kirk & Baum, Cincinnati, sheet metal workers, are just finishing up the sixteenth of a series of exhaust systems for the National Cash Register Company, Dayton, Ohio. Other late contracts include systems for the Jeffries Mfg. Company, Columbus, Dayton Planing & Mfg. Company, Dayton, and the American Seeding Machinery Company, Richmond, Ind.

The Marine Boiler Works, Toledo, Ohio, has prepared plans for a one-story addition to its plant, 80 x 120 ft., on Front street. Heretofore the company only made marine boilers, but expects now to engage in the manufacture of all kinds. John Weber is president.

The city of Portsmouth, Ohio, has voted favorably on a $100,000 bond issue to be used in building a new water works plant.

The John A. Stewart Electric Company, whose offices are in the First National Bank Building, Cincinnati, is erecting a one-story, 56 x 112 ft., steel and concrete warehouse at Langdon and Eastern avenues, which will be used as a storage building for electric and steam machinery.

The combination machine and blacksmith shop and round house buildings at Melbourne, Ky., now being erected for the Chesapeake & Ohio Railroad Company, by the Westinghouse-Church-Kerr Company, New York, are nearly completed, and the necessary tools and equipment are expected to be installed before February. The coal elevator will not be finished for some time.

The Canton Bridge Company, Canton, Ohio, has been given the contract for 25 bridges to be built in the vicinity of Nowata, Okla.

Detroit

DETROIT, MICH., November 22, 1910.

The scarcity of new enterprises, noted last week, continues, and there is less heard than formerly of the extension or remodeling of existing plants. Routine inquiries, however, have shown a fair aggregate, and there is a great deal of quiet buying which it is difficult to trace for the reason that it consists mainly of repeat orders or applies on what are practically season contracts.

It is reported from Muskegon, Mich., that the National Boat & Engine Company has been organized there with a capital stock of $10,000,000 to include many of the leading boat manufacturing concerns of the country, the largest of which is the Racine Boat Mfg. Company of that place. Others are the Truscott Boat Mfg. Company, St. Joseph, Mich.; Pope Boat Company, Fond du Lac, Wis.; Shell Lake Boat Company, Shell Lake, Wis.; Western Boat & Engine Works, Michigan City, Ind.; West Mystic Mfg. Company, West Mystic, Conn., and Inland Lakes Boat Company, Lake Geneva, Wis. It is stated that these companies produce nearly 90 per cent. of the motor boats and pleasure craft built in the East and Middle West, and that it is the ultimate intention of the combine to take up the manufacture of aeroplanes also. The president is Wm. J. Reynolds, and the secretary John Q. Ross, both of whom are residents of Muskegon.

The Blesch Metal Mfg. Company has been organized in Detroit with a capital stock of $15,000, by Otto Blesch, Edward E. Pratt and Hugh M. Edwards.

A bond issue of $400,000 has been voted at Flint, Mich., to cover the cost of improvements to the water works system, including a modern filtration plant.

S. F. Dobbins, Marshall, Mich., is awarding construction contracts for a two-story shop, 146 x 468 ft.; foundry, 100 x 162 ft., and an office building, 40 x 44 ft., for the Marshall Furnace Company.

A large addition, more than doubling its present capacity, will be made to the manufacturing plant of the Adjustable Table Company, Grand Rapids, Mich.

A new type of gasoline motor is to be produced in Detroit by the Automobile Mfg. & Engineering Company, which is planning the erection of a factory, the initial structure being 55 x 60 ft., with frontage on Harper avenue. R. H. Evans of this city is secretary and treasurer of the company.

The American Motor Castings Company, Detroit, is busy on orders from the automobile companies.

A bond issue has been voted by the city of Durand, Mich., to cover the cost of installing a municipal pumping plant.

Work has been commenced on the addition to the manufacturing plant of the Wagemaker Furniture Company, Ltd., Grand Rapids, Mich., which will consist of two stories and a basement, 46 x 100 ft., and a storage building, 20 x 40 ft.

It is reported from Saginaw, Mich., although without direct confirmation, that the Brooks Boat Company of that place will arrange shortly for the manufacture of aeroplanes, having secured an expert in that line of work as superintendent.

Provision will be made shortly for a new shop, foundry and roundhouse, with complete modern equipment, to replace the structure of the Boyne City, Gaylord & Alpena Railway, Boyne City, Mich., which was recently destroyed by fire.

A new company, with which W. A. Foote, Lansing, Mich., president of the Commonwealth Power Company, is stated to be identified, is planning the construction of an electric traction line from Lansing to Battle Creek, and will be in the market toward spring for considerable equipment.

The Hancock Consolidated Mining Company, Hancock, Mich., will erect its own stamp mill as soon as the plans for it have been definitely worked out. Meanwhile, its ore will be treated at one of the other plants in the vicinity.

The Michigan United Railways, Lansing, Mich., will install a very complete machine shop for repair work in connection with the new carhouse to be built there.

Plans are reported to be in progress for a new factory building of the Auto Parts Mfg. Company, Detroit, which will be a one-story structure, 75 x 180 ft.

Negotiations are now pending at Big Rapids, Mich., which include the taking over of a local electric plant by the city and changing the arrangement of the pumping station to permit of motor drive instead of steam operation.

The N. Michelson Company, Michelson, Mich., is adding a planing mill to its timber cutting plant, and will equip it with the most modern machinery.

The Prescott Company, Menominee, Mich., will furnish machinery to double the present capacity of the newly completed Von Platan sawmill at Iron Mountain, Mich., but the addition will not be made much before spring.

The Allouez Mining Company, Allouez, Mich., is planning the installation at its No. 2 shaft of a new high duty air compressor and hoisting plant with steel rock house, crushing equipment. These improvements are not, however, to be carried into effect before next summer.

The Handy Press Company, Grand Rapids, Mich., has been incorporated with $42,500 capital stock. The officers of the company are: William C. Brummeler, president; A. J. Brummeler, vice-president; R. J. Brummeler, treasurer; W. N. Edson, secretary.

Indianapolis

INDIANAPOLIS, IND., November 22, 1910.

The Eureka Mfg. Company has been incorporated at Newcastle, Ind., with $15,000 capital stock, to manufacture household furniture. The directors are H. C. Land, T. M. McKee, J. A. Royer.

The Floyd Mfg. Company has been incorporated at New Albany, Ind., with $10,000 capital stock, to manufacture agricultural implements. The directors are John Floyd, P. L. Hamilton, C. G. Smith.

The Roller Door Hanger Mfg. Company has been incorporated at Elkhart, Ind., with $10,000 capital stock, to manufacture hangers, tracks and other articles. The directors are George W. Stuyverson, E. J. Browne, George S. Stuyverson.

James J. Quinlan of Muncie, Ind., has bought a site at Indianapolis of four acres for a proposed plant to manufacture boilers and machinery, which will cost $200,000.

The Indiana Novelty Company has been incorporated at East Gary, Ind., with $10,000 capital stock, to do a general manufacturing business. The directors are F. D. Covington, George Earle and William Earle.

The Leesburg Light & Water Company has been incorporated at Leesburg, Ind., with $10,000 capital stock, to supply electricity. The directors are F. Boetz, W. H. Stanley and A. H. Brown.

The McDougall Kitchen Cabinet Company, Frankfort, Ind., has bought the Biggs Mfg. Company at Lafayette, Ind., whose kitchen cabinet plant was about ready to start.

The Peerless Pacific Company has been incorporated at Evansville, Ind., with $10,000 capital stock, to manufacture

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plumbers' supplies. The directors are George R. Smith, M. D. Helfrich, H. F. Weaver.

The Midland Furniture Company has been incorporated at Evansville, Ind., with $50,000 capital stock, to manufacture furniture. The directors are J. C. Stephan, F. W. Gumberts, I. Rosenthal.

The Madison Mfg. Company has been incorporated at Elwood, Ind., with $50,000 capital stock, to manufacture glass factory supplies. The directors are I. H. Deakin, John Klumpp, Sr., John Klumpp, Jr.

The American Drill Company, Marion, Ind., has increased its capital stock and is preparing to enlarge its output of farming tools. At the annual meeting of the company, recently held, the following officers were elected: H. D. Hunter, president; J. A. Work, vice-president; J. S. Hunter, secretary; John C. Haswell, treasurer.

The Banner Mfg. Company, Ferdinand, Ind., is erecting a factory building, 40 x 88 ft., which will be used as a foundry and machine shop. The building when completed will be equipped with a 24-hp. engine and boiler, two pipe machines, four lathes, three drill presses and complete foundry equipment.

Pittsburgh

PITTSBURGH, PA., November 22, 1910.

Within the past week the market has been characterized by renewed vigor, but this is evidenced more in the tone of pending inquiries than by the actual volume of purchasing, which continues rather light for the season.

The contract recently placed with the Westinghouse Electric & Mfg. Company for machinery to be installed near Dante, Va., by the Clinchfield Coal Corporation has attracted much attention here, as well as elsewhere through the country, from the fact that it amounts to $500,000; but this is only one of numerous improvements that have been among the mainstays of the machinery market, and more are to follow. Some of the leading coal mining and handling companies have decided definitely upon a policy of expansion which will find expression in a large aggregate of purchases both of mechanical and electrical equipment.

The filtration plant of the Monessen Waterworks Company, Monessen, Pa., will be considerably extended and improved. Chester & Fleming, Pittsburgh, are the engineers in charge of the work.

One of the large equipment companies here will figure shortly on material and machinery for the Blue Ridge Railway Company, Hagerstown, Md., which is about to start construction work on its line. J. Clarence Lane of that place is one of the leading incorporators.

The Cyclops Steel Company, Titusville, Pa., will begin the new year with considerably enlarged and improved manufacturing facilities, the extension of which is now in progress.

A 50-ton refrigerating plant is to be installed by P. C. Schuller, Pittsburgh, in a new two-story building on Short street, adjacent to Stormer Alley.

There are indications that the work of enlarging the Schoen Steel Car Works at McKeesport, Pa., will be undertaken in the near future, additional land having been secured for that purpose by the Carnegie Steel Company.

The electrically operated units for the new Scioto River Pumping Station at Columbus, Ohio, will be furnished by the Platt Iron Works Company, Dayton, Ohio.

Plans for a modern water works system for Lowellville, Ohio, have been prepared by J. Richard Kommer, Pittsburgh. Very little equipment will be required, as a gravity flow can be utilized.

Included in the bond issues voted by the city of Pittsburgh at the recent election is an appropriation of $100,000 to cover the cost of erecting an incineration plant.

Manufacturers of pumping machinery located in this district are preparing to bid on three centrifugal pumping units, of 5,000,000 gal. each, for the city of Dayton, Ohio. Preliminary figures are also being made on two new pumping engines for Cleveland, Ohio, each having a daily capacity of 25,000,000 gal., and four centrifugal pumps of 10,000,000 gal. each to be operated either by gas engines or electric motors. In both cases other equipment is expected to be purchased at the same time, or a little later, but the full list has not yet been announced.

An eight-story warehouse building on First avenue, Pittsburgh, has been leased by the Westinghouse Electric & Mfg. Company, and will be used in place of the structure now occupied by that company on the North Side, the facilities of which have been outgrown. It is stated that in the new building a very complete repair shop will be installed, something which the company has not heretofore maintained outside of its plant at East Pittsburgh.

The new buildings and other improvements at the works of the Pittsburgh Plate Glass Company in Ford City, Pa., will be completed by January 1 and all departments placed in full operation. Some minor details of equipment are still to be provided.

The Keefer Coal & Coke Company, Pittsburgh, of which W. W. Keefer is the principal incorporator, has been organized to operate in Fayette County, W. Va.

Milwaukee

MILWAUKEE, WIS., November 21, 1910.

Power pumping, air compressor and hoisting outfits are selling to excellent advantage as compared with other lines of production, and the demand for such has been fairly well maintained all through the fall, due to the fact that these units enter into so many phases of the industrial life of the country and are needed in every part of the world. The export demand has, of itself, been sufficient to cut quite a figure in the situation, particularly when the sales made to Northwestern Canada and the states of Mexico are considered as export trade.

It is reported from Sheboygan, Wis., that the Jacob J. Vollrath Mfg. Company is taking bids on a gas producer house 28 x 80 ft. of steel frame structure and on other details of factory buildings, warehouse, &c., now under construction.

The Hardwood Products Company, Neenah, Wis., has let a contract for its steam generating equipment to Wickes Brothers, Saginaw, Mich. The initial battery will include two boilers of 250 hp. each.

The Kissel Motor Company, Hartford, Wis., is installing two elevated steel tanks, a pumping unit and a sprinkler system of fire protection.

A new factory will probably be erected in the spring by the Northwestern Furniture Company, Milwaukee.

The Mosinee Electric Company, recently organized at Wausau, Wis., by Neal Brown and others, will build a power and lighting plant at Mosinee, Wis., operated from a transformer station.

The Tomahawk Iron Works, Tomahawk, Wis., has overhauled in its shops and put in shape for reselling a number of heavy logging locomotives.

An addition will be made shortly to the box factory of the Water-Clarke Lumber Company, Superior, Wis., and considerable new machinery provided.

The Fred M. Prescott Steam Pump Works and the Allis-Chalmers Company of this city are among the bidders on a 6,000,000 gal. pumping engine for the city of Wellsburg, W. Va.

The Oslo Lighting & Power Company, Manitowoc, Wis., will purchase, shortly, the equipment for a steam engine-driven power plant, including boilers, for installation at Valders, Wis.

The new plant to be operated by the Wisconsin Furniture Mfg. Company, which will be built at Neilsville, Wis., to replace the factory of the Reliable Furniture Mfg. Company, that burned some time ago, will consist of two buildings, one 80 x 200 ft., two stories, and the other 80 x 140 ft., one story. A complete line of modern woodworking machinery will be provided, but it has not yet been decided whether to install a steam power plant or to purchase current. In either case, however, electric motors will be used.

P. J. Holme Company, manufacturer of gasoline engines at Eau Claire, Wis., is removing to a larger plant and increasing its facilities for the season's production.

A generating plant will be built in the spring by the Endeavor Electric Light & Power Company, Endeavor, Wis., of which William H. Burwell is manager.

The Lamsen Automatic Pump Company, Eau Claire, Wis., recently incorporated for the manufacture of automatic pumps for irrigation, city water works and private plants, advises that it will not erect a factory until next spring. The company will contract for the manufacture of its product until its own factory is completed and is now interested in getting prices for this purpose. The pumps weigh from 280 pounds to four tons.

St. Louis

ST. LOUIS, November 21, 1910.

While the machine tool business continues quiet, there seems to be evidence of a fairly early resumption of activity. Inquiries for some heavy tools have come into the market from parties not buying recently, and some pretty good orders have been actually placed by the large steel casting companies here during the last week.

The Crane Company has purchased property on the

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Terminal tracks and will start work on a large addition to its warehouse facilities here at once.

The Acme Truck & Tool Company has been reorganized and the name changed to the Acme Tool Company. It makes a line of heavy forging specialties.

The St. Louis Trunk Hardware Mfg. Company finds business fairly good for this season.

The National Chair Company, with a paid up capital stock of $25,000, is purchasing machinery for its new plant in North St. Louis. Joseph J. Yawtz, formerly treasurer of the Mound City Chair Company, is president.

The city of St. Louis is advertising for bids for furnishing pumps as per requisitions.

The Woods Electric Vehicle Company, St. Louis, has been incorporated, with a capital stock of $25,000. The incorporators are Louis E. Burr, Thomas Clements and A. B. Schaeffer.

The Carter Aeroplane Company, St. Louis, has been incorporated, with a capital stock, fully paid, of $7000. The incorporators are O. H. Hyde, D. B. Hyde, L. A. Carter and others.

The John Stanard Bronson Machinery Company, St. Louis, has been incorporated, with a capital stock, fully paid, of $5000. The incorporators are L. B. Bronson, L. E. Jacques and J. S. Bronson. The company will engage in the manufacture of machinery.

The Sunrise Iron & Mining Company, St. Louis, has been incorporated, with a capital stock, fully paid, of $200,000. The incorporators are Wm. A. Bright, Frank M. Overlees and Pascal Parker, all of Liberty, Mo.; L. G. Bronson of Joliet, Ill., and Frank Daughmer of Douglass, Ill.

The National Gas Machine Company, St. Louis, has been incorporated, with a capital stock, fully paid, of $100,000. The incorporators are Bert F. Fenn, M. Laux and R. G. Lewis. The company will engage in the manufacture of gas machinery and devices for making and supplying gas.

The Tombs Roller-Bearing Wheel Company, St. Louis, has been incorporated, with a capital stock of $50,000. The incorporators are J. M. Tombs, B. S. Adams and Thos. J. Edwards.

The Central Screen Mfg. Company, St. Louis, certifies to an increase of its capital stock from $35,000 to $100,000.

The American Shoe Machinery & Tool Company, St. Louis, has been incorporated, with a capital stock of $15,000. The incorporators are Abraham Black, Benj. Medalla and Louis A. Black.

The Memphis & North Arkansas Railroad will erect machine shops at Leslie, Ark., and also a passenger station. Work on the shops will be started within 30 days.

The plant of the Galena Lead & Smelter Company at Galena, Kan., owned by Hammar Bros. of St. Louis, was almost totally destroyed by fire November 13. The loss is $20,000, partially covered by insurance.

The Fort Worth Glass Mfg. Company, Fort Worth, Texas, has been incorporated, with a capital stock of $100,000. The incorporators are David Watson, J. D. Lattimore and C. A. R. Gotesman.

Toronto

TORONTO, November 19, 1910.

The demand for machinery of nearly all kinds is still well sustained. Complaints continue to be made about the scarcity of skilled labor. There is also a shortage of unskilled labor. It is stated that inability to man factories up to the required strength is causing orders to be sent to the United States for machinery that would otherwise be made here. Trade would be still better, too, if the condition of the roads were better.

At its meeting on November 14 the City Council of Montreal, Que., adopted a resolution providing for the preparation of many by-laws for the borrowing of $10,000,000, the money to be applied toward the construction of necessary public works. The expenditure is to be distributed as follows: $1,000,000 for the enlargement of the water works plant, $1,500,000 for a filtration plant, $1,000,000 for a municipal lighting plant, $1,000,000 for underground conduits, $4,500,000 on street improvements, &c., and $1,000,000 for working capital. It was also decided at the meeting to purchase an electric motor and pump from the John McDougall Caledonian Iron Works Company, Montreal.

W. C. Franz, manager of the Lake Superior Corporation, says that arrangements have been made for the building and equipment of a $1,000,000 paper mill at Sault Ste. Marie, Ont.

The Ottawa Car Company is making extensive additions to its works in Ottawa, Ont., where 400 men are now employed.

The Gilson Gasoline Engine Company, Guelph, Ont., is making an addition to its works, and will install new machinery.

W. W. Hesson and W. E. Rothwell, Toronto, are preparing to begin operations in the manufacturing of carpet sweepers, vacuum cleaners, clothes washers, &c., in Guelph, Ont.

The Dorchester Electric Light Company has received permission to enter the city of Quebec and carry on business there, one of the conditions being that before the end of next year it shall erect and operate workshops to cost at least $200,000.

The town of Pembroke, Ont., has under consideration water works improvements to cost $65,000. These will include the putting in of new pumping machinery.

On November 17 the Lake Superior Corporation began the use of the first of the gas blowing engines it is to install at its blast furnaces at Sault Ste. Marie, Ont. Seven other such gas driven engines are to be put in.

The Superior Rolling Mills Company, in which C. R. Hosmer, H. S. Holt, F. W. Thompson and other Montreal capitalists are prominent, has acquired a property in Fort William, Ont., on which it is proposed to establish steel works next spring.

Some Montreal men have associated themselves to go into the business of manufacturing automobiles in the town of St. John's, Quebec, if that municipality will grant a bonus of $20,000, a free site, and exemption from taxation. The cars manufactured will be equipped with 30 to 35 hp. engines. The officials of the company are: Julien Therien, president; Theophile Trudeau, vice-president; A. Vinet, secretary-treasurer. The capital stock of the company is to be made up of $200,000 common and $100,000 preferred stock.

The issue of £1,000,000 bonds by Price Bros. & Co., Quebec, Que., who will use the money for the construction of great paper mills, was oversubscribed in London.

A company is being organized to take over the two former concerns at Grand Falls, N. B., and to build a large pulp mill and paper plant there. Sir William Van Horne is mentioned as the principal figure in the new project, and it is stated that the pulp and paper works will cost $7,000,000.

Theodore A. Burrows, a Winnipeg man of large timber and lumbering operations, will build a sawmill costing $60,000 on the McLeod River near Medicine Lodge on the Grand Trunk Pacific Railway.

The Canadian Auto-Press Company, Ltd., Toronto, Ont., will build and equip a large addition to its recently acquired plant at Eastern and Carlaw avenues, Toronto, for the manufacture of printing presses.

The Cockshutt Plow Company is building a large addition to its works at Brantford, Ont.

The Gurney Scale Company has commenced construction of its new manufacturing plant at Hamilton, Ont.

New England

BOSTON, MASS., November 22, 1910.

The dealers have experienced little change in business conditions. The demand is "so-so," to quote one house. It could be a great deal worse, and it could be better. Probably it reaches the average of dull and good times, and the inclination is upwards. Inquiries are somewhat more promising. A good-sized list of the General Electric Company for the Lynn Works is held up temporarily. The United Shoe Machinery Company continues buying as a matter of routine, following its almost invariable custom.

Among the manufacturers of machinery the tendency is toward a better business. Some works have received an important access of orders, which are exceeding production, where the contrary was true a month ago. Foreign business is considerably better than it has been for some time. Certain shops have curtailed their output and have laid off men, but skilled labor is retained, the vacancies being confined to the classes of labor most easily replaced. The supply of first-class mechanics has shown no very noticeable increase, since the absorption of the men who were released from employment by the absorption of the Plant shoe machinery interests by the United Shoe Machinery Company. Employers look to see another labor famine, increasing in its effect with the gradual growth of business, which is expected from now on, gradual at first, but culminating rapidly after the begining of 1911.

The mechanical department of the New York, New Haven & Hartford Railroad has recommended the extension of the repair shops of the Boston & Maine system, an allied company, at Concord, N. H. The report calls for a new machine shop and boiler shop, the installation of electric cranes of huge capacity and a 130-ft. extension of the erecting room. The report means that, if it is acted upon favorably, a large amount of new machinery will be purchased.

H. D. Smith & Co., Plantsville, Conn., manufacturers of

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vehicle and special drop forgings and drop forged tools, have completed plans for a new manufacturing building, which will replace that destroyed by fire recently. It will be 40 x 415 ft., one story, of brick and steel, with concrete foundations, and will house the die sinking department, machine room, finishing department and assembling department. The company is now purchasing machinery and other equipment.

H. R. Sinclair, of the W. & S. Mfg. Company, Worcester, Mass., has acquired the interest in the business of J. Fred Wilson, who retires from the firm. Mr. Sinclair, who has had charge of most of the estimating and of the manufacturing, will continue to conduct these departments. During the past five years, since the modern factory was erected, the company has made important improvements, including the installation of better machine tools for die making, light and heavy single and double action presses, special armature notching machinery, drop hammer with gas furnace for hot forming, increased polishing and plating facilities, and a large increase in standard sizes of round, square and hexagon dies. The company does metal punching, die making, polishing and electro plating, and makes a specialty of all kinds of special washers and stamped work, flat, formed or drawn, up to 10-in. discs from 3-16-in. steel, or 5-in. discs from ½-in. steel.

The business of the Lounsbury Machine Works, State and Wall streets, New Haven, Conn., has been absorbed by the Lounsbury & Riley Works, a new Connecticut corporation with capital stock of $20,000. John C. Lounsbury is the president and secretary and F. C. Riley, treasurer, the third incorporator being S. C. Riley. The company manufactures small special machinery and at the present time is producing a special wrench on order and some special riveting tools. A small household grinder, which the company will market under its own name, is now being manufactured. The company is in the market for a second-hand universal milling machine and a 24-in. engine lathe.

The proposed absorption of the Boston, Revere Beach & Lynn railroad by the Boston & Maine, and New York, New Haven & Hartford interests, which will go through if legislative permission is granted this winter, entails large engineering works, comprising the building of a tunnel under Boston harbor, connecting East Boston and South Station, and the standardizing of the line to be acquired, which is now a narrow gauge.

Middletown, Conn., held its first industrial exposition last week, which was so great a success that it will undoubtedly be repeated. The exhibits included manufactured products of Wilcox, Crittendon Company, marine hardware; W. & B. Douglas, pumps; Prentice Mfg. Company, rules; New England Enamelling Company; I. E. Palmer, hammocks; and the Noiseless Typewriter Company.

Additions to general manufacturing plants include the following: Cushnoc Paper Company, Augusta, Maine, pulp grinding mill of reinforced concrete, 60 x 74 ft.; Draper Bros., Canton, Mass., blanket mill, 60 x 100 ft., two stories; Providence Box & Lumber Company, Providence, R. I., factory at Arlington, R. I., 80 x 200 ft., with wing 40 x 40 ft., and power house 32 x 67 ft.

The Ball Bearing Shade Roller Company, Naugatuck, Conn., has made a large increase to its capital and states that the money will be used for extending the business.

The Malleable Iron Works, New Britain, Conn., manufacturer of malleable iron castings, will erect a brick addition to its foundry, 40 x 80 ft., with saw tooth roof and skylights.

The Roberts Mfg. Company, Somerville, Mass., manufacturer of bolt clippers, has removed its factory to a modern building at Beacon and Park streets, and will gradually add new machinery.

The Waterbury Farrel Foundry & Machine Company, Waterbury, Conn., has awarded the contract for its new building, which will be about 64 x 100 ft., one story, of mill construction.

San Francisco

SAN FRANCISCO, November 16, 1910.

A report, in the nature of a compromise, has been submitted by the Committee of Arbitration, which has been considering the questions at issue between the San Francisco iron working shops and the labor unions. The committee's recommendations are not binding, however, and it is by no means certain that the arrangement proposed will be adopted. In view of the uncertainty which still exists, none of the local shops is buying any machine tools, except such as are absolutely necessary, and the equipment in most shops is fully adequate for the work on hand. Some of the larger shops in the interior are also hampered by labor conditions, and no business of much importance is coming from any quarter. A general curtailment has been noted since the first of the month in the foundry business throughout the district tributary to San Francisco.

Wood working machinery is dull, and while there are a few scattered inquiries of some importance very little new business is expected before the first of the year. Several mines in the northern district of California and Nevada are placing new orders for motors, pumps, compressors, &c., but traveling men returning from the southern district, including Arizona, report little business. There is some prospect, however, that the southern mines will come into the market more actively before spring. New inquiries, which will doubtless result in substantial orders within the next few months, are coming in from some of the rock and stone quarries in the southern district, and figures are being taken on large additions to some of the cement mills. Contracts are to be placed shortly for a lot of new machinery for a mill of the Standard Portland Cement Company of this city.

In addition to several large gold dredger contracts recently let by California parties, mining engineers returning from the Nome and Iditarod districts of Alaska state that at least 12 dredgers will be required there next year, and consider the outlook excellent for future business throughout that territory. It is stated that hand placer mining has about reached its limit, and improved machinery will be needed to reach deposits lying at a greater depth.

Since the visit of Secretary of the Navy Meyer to this coast, it is announced that the channel leading to the Mare Island, Cal., navy yard is to be deepened, which is taken as an indication that the needed improvements will soon be made in the equipment of the yard itself. Local machinery firms also look for considerable business in the future from the navy yards on Puget Sound and at Pearl Harbor, Hawaii.

Various interurban traction companies in California have shown considerable activity in the last few weeks in extending their lines, and are entering the market to some extent for rolling stock and general equipment. S. N. Griffith, who is working on a line between Fresno and Clovis, has been in the city conferring with representatives of the Western Electric Company on specifications for power equipment. The Central California Traction Company is planning extensive improvements to its service in Stockton, Cal. The Northern Electric Company is building the largest electric locomotive in the state at its shops at Chico, Cal., to be equipped with a 660 hp. motor. It is reported that the Redondo Railway Company will erect a large car shop at Hawthorne, Cal.

The Holt Mfg. Company, Stockton, Cal., recently shipped a harvester to Argentina, and expects to get considerable business in that country in its lines of harvesters and caterpillar traction engines.

Refrigerating machinery is in fair demand, and considerable business is expected during the winter and spring by several local firms which specialize in this line. The Vulcan Iron Works has had considerable work of this nature recently, and the Parker Iron Works of San Bernardino, Cal., has taken a number of small contracts in the southern territory. The Union Ice Company is adding a new unit to its Los Angeles plant.

Electric power plants and general equipment of moderate capacity are in steady demand, and plans are being developed for a number of large installations to be carried out during the next few days. Surveys are being made for a large addition to the Great Western Power Company's plant on the Feather River, for which a four-mile tunnel will be required.

The Auto Mfg. Company, E. C. Collins, president, has secured a tract of land near Sacramento, Cal., and will, according to announcement, erect an automobile factory, including foundry, machine shops, &c., plans for which are now being drawn.

C. Ruehle and Geo. Eltiste have taken over the forge and machine shop formerly conducted by J. C. Williams & son, at Orange, Cal.

The Morton Gas Engine Company, Fresno, Cal., will hold a meeting of stockholders January 16 to increase the capital stock.

H. E. Boyrie, formerly Seattle manager for C. C. Moore & Co., is now sales manager for the Tracy Engineering Company, San Francisco agent for Nordberg Corliss engines, &c.

The Berkeley Sheet Metal Works recently took over the business of Riddle, Vaughn & Co., San Francisco, and has secured a location for a new factory on the Southern Pacific line in West Berkeley, Cal.

The North Star Mining Company is putting in equipment for a narrow-gauge electric tramway connecting its two mines near Grass Valley, Cal.

The Riverside Portland Cement Company has completed plans for additions to its plant near Riverside, Cal., to be carried out during the winter. Eight ball mills, 10 tube

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mills, and a large amount of other machinery will be installed.

F. J. Lea, vice-president and general manager of the New Pedrara Mexican Onyx Company, is visiting the quarries in Lower California to prepare for the installation of new machinery. A number of pneumatic drills and a lot of surfacing machinery will be installed.

The fire and police commissioners of Oakland have recommended the appropriation of $51,750 for additional fire apparatus, including three motor propelled chemical and hose wagons, motor propelled pumping engine, and two steam fire engines.

The Los Angeles Improvement Company, Los Angeles, has started preliminary work on a woodworking plant, which it announces will be the largest in California, the estimated cost being about $500,000.

The Southwest

KANSAS CITY, MO., Nov. 21, 1910.

Municipal buying continues to exert the most important influence upon the machinery market, particularly in the purchase of steam and gas engines, electric units, pumping machinery and auxiliary appliances. A good many private companies have, however, recently been formed to establish public service plants, which frequently include refrigerating outfits; and the building of electric traction lines is still bringing out a good many inquiries for construction, power and operating equipment. Mining operations are also offering good opportunities for the sale of equipment; and in the line of irrigation, drainage, water power and other development projects there has recently been much figuring on future requirements.

It is reported from Guthrie, Okla., that the Attorney-General of the State, since March 24, 1910, has approved of the following water works bond issues for cities and towns in that State, which are about to build municipal plants in the near future. There are 31 issues, totaling $1,323,000: Krebs, $5000; Gage, $30,000; Spiro, $40,000; Cherokee, $5000; Chelsea, $58,000; Weatherford, $30,000; Wewoka, $35,000; Wetumka, $36,000; Apache, $30,000; Altus, $130,000; Coalgate, $30,000; Grandfield, $28,000; Pryor Creek, $65,000; Okeene, $30,000; Gotebo, $28,000; Poteau, $12,000; Durant, $20,000; Medford, $12,000; Isabel, $40,000; Enid, $25,000; Maud, $10,000; Elk City, $15,000; Lawton, $200,000 for a dam and reservoir; Stigler, $45,000; Krebs, $10,000 more; Lawton, $40,000 more; Cushing, $25,000; Hominy, $25,000; El Reno, $250,000; Roosevelt, $20,000; Granfield, $16,000 more. Under an act that went into effect March 24, the Attorney-General of Oklahoma is made State Bond Commissioner, and must pass upon and approve all State, county, municipal, city and school district bonds issued in Oklahoma before they can be sold.

The Climax Mining Company, operating in what is known as the Hassayampa district, near Prescott, Ariz., will remodel its plant and install some new machinery.

The Silver Hill Mill & Mining Company, recently organized at Shafter, Texas, has secured a large section of mineral land there and will install machinery sufficient to inaugurate extensive development work.

The King City Light & Power Company, King City, Mo., will install a producer gas engine unit, including an alternating current generator of about 50 kw.

Machinery for a pumping plant and water works system to be installed at Yukon, Okla., will be purchased during the coming month.

Plans for the proposed hydroelectric power development near Tucson, Ariz., to furnish power for municipal pumping and lighting service, will probably be put into effect by or before spring.

Improvements which will probably be made to the water works at Newton, Kan., include a new pumping engine of large capacity and a motor driven deep well pump.

A project for the enlargement of the water works system at Oklahoma City, Okla., which will involve the expenditure of a large sum for the purchase of machinery, has taken definite form in the appointment of an engineer to prepare the necessary plans, specifications and estimates.

The O'Neil Enginering Company, Dallas, is at work on plans for a municipal pumping plant to be constructed at Hearne, Texas.

There will in future be a good market for motors and other electrical apparatus among the mining companies in the vicinity of Jerome, Ariz., where the new system of machinery drive is being generally introduced. With the completion of a power transmission line from the large hydroelectric plant on Fossil Creek it will go into effect.

Extensive improvements, which include the purchase of considerable power equipment, will probably be entered upon in the near future by the Citizens' Light & Transit Company, Pine Bluff, Ark.

Work is about to begin on the foundations of the new shops and roundhouses to be erected at Sweetwater, Texas, by the Atchison, Topeka & Santa Fe Railway.

Southern Texas

AUSTIN, TEXAS, November 19, 1910.

Good rains have fallen over most of the agricultural portions of the state during the last few days and have had the effect of stimulating various lines of business. Machinery dealers report that the condition of trade is better than this time last year. There is a wider demand than ever known.

D. Z. Evans, Philadelphia, Pa., contemplates the erection of a plant at Austin for the manufacture of cement brick and blocks. He expects to invest $30,000 to $50,000 in the enterprise. It is claimed by experts that the sand and cement material here are specially suited for the purposes which Mr. Evans has in view.

J. A. Logwood, San Antonio, has been granted a franchise by the county commissioners of Bexar County for the construction of an electric railway from Harlandale through a suburban district extending some distance beyond that place on the Corpus Christi road.

The City Council of Beaumont is considering the matter of requiring the owners of the municipal water works system to provide a new water supply. It is estimated by W. C. Teter, principal owner of the system, that it would cost not less than $300,000 to develop a new source of water supply for the city. The rice irrigation canals are taking an enormous quantity of water from the river during the growing season, and this causes salt water to enter the bed from the Gulf and impregnate the water supply of the city.

An application for a gas plant and distributing system franchise has been made to the City Council of Brownsville, Texas, by Caloni Moody of Corpus Christi, Texas. He contemplates investing from $50,000 to $60,000 in the enterprise.

Fordyce Ridley of Galveston and associates will construct a street railway line in Texas City, Texas. It will run from the bay shore to Texas City Heights.

Lon C. Hill, Harlingen, Texas, has finished revising the plans for the large sugar mill that he will erect at that place. The plant will cost about $400,000.

W. C. Day, state superintendent of public buildings and grounds at Austin, will ask the legislature to make an appropriation of $10,000 for the purchase of new machinery for the state power and heating plant here.

The issue of $50,000 of water works bonds by the municipal government of Denison, Texas, has been formally approved by the attorney general. The proceeds will be used to extend the water works distributing system and to enlarge the pumping plant.

The Beeville Ice & Power Company will install a light and power plant at Beeville, Texas. It will be operated in conjunction with the company's ice factory.

The Guerrero Mining & Milling Company will install a large ore reduction mill at its mines in the Balsas district, state of Guerrero, Mexico. Collin Timmons is manager and principal owner of the property.

The Compania Explotadora de Minas, Puebla, Mexico, has adopted plans for a new cyanide plant, which it will install at its mines.

The Magistral-Ameca Copper Company, Ameca, Mexico, will enlarge its reduction mill, install a compressor and make other extensive improvements at its mines.

The Inde Consolidated Mines Company, Inde, state of Durango, Mexico, will install new boilers and pumps at its Gran Lucero mine.

The Inde Gold Mining Company, Inde, Mexico, contemplates enlarging its cyanide plant from 100 tons to 150 tons daily.

The Guadalupe Mines Company, Inde, Mexico, has under consideration the matter of installing a large reduction mill.

The Candelaria Mining Company, Santa Barbara, state of Chihuahua, Mexico, contemplates installing a 50-ton cyanide plant. George C. Hackstaff is manager.

It is announced that the American syndicate, headed by A. J. McQuatters of Dallas, Texas, which recently purchased the extensive mining, railroad and other holdings of the Hidalgo Mining Company, Parral, Mexico, will purchase a large amount of new machinery and equipment for the mines and mills.

The Rio del Oro Exploration Company, Placeres del Oro, state of Guerrero, Mexico, will install considerable mining machinery in order to carry on extensive development work on its properties in that district.

The Patombo Mining Company will install a 40-ton amal-

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gamation and concentrating plant at its mines in the Placeres del Oro district, state of Guerrero, Mexico.

The Compania de Madera de la Sierra, Llano Grande, state of Durango, Mexico, has just been granted a concession by the government of that state for the construction of a lumber mill of 190,000 ft. daily capacity, and the erection of factories for the manufacture of boxes, doors, sash, etc. The company is required to expend not less than $800,000 in the establishment of these industrial plants. A large amount of machinery will be purchased. The construction work must be commenced at once and the improvements finished within two years, under penalty of forfeiting the concession. The company will also install a hydroelectric plant to provide power for operating the mill and factories.

An irrigation enterprise of great magnitude is planned by a syndicate of San Antonio men which includes A. Y. Walton, Jr., Terrell Bartlett, Willis Ranney and Duval West. They have filed on all of the unappropriated waters of the Medina River and its tributaries in Texas, comprising a watershed of about 700 square miles. The syndicate will construct two large dams. The irrigation of approximately 150,000 acres of land is contemplated. A large amount of pumping machinery will be installed.

The City Council of Rush, Texas, is arranging for the construction of a water works system at a cost of $18,000.

Wortham, Texas, will award contracts in the near future for the construction of a water works system at a cost of $8,000.

The South

NASHVILLE, TENN., November 21, 1910.

The Tennessee Traction Company, of which W. K. Burton, Memphis, Tenn., is president, will start construction work early in the spring, and plans for the complete equipment of the line, including power machinery, are expected to be worked out during the winter. It is the intention to build from Memphis to Nashville, via Jackson, Tenn.

The proceeds of a bond issue of $30,000 are now available at Patterson, La., for the purchase of pumping machinery and other equipment needed in a modern system of municipal water works.

Ladshaw & Ladshaw, Spartansburg, S. C., have complete plans in hand for the construction of a large hydroelectric plant for the Nolachucky Power Company, work upon which will be well under way by spring.

A large new duplex pump has been installed in the municipal water works station at New Iberia, La., by the Platt Iron Works, Dayton, Ohio.

S. J. Warren & Co., Jacksonville, Fla., have been installing new equipment in their mill and will probably effect further improvements in the spring.

A new manufacturing plant will be established in or near Birmingham, Ala., by the Birmingham Frogless Switch Company, recently organized there, the officers of which are S. E. Risher, president; Charles T. Stacks, vice-president, and W. C. Hawkins, secretary and treasurer.

A saw mill, the equipment for which has been partially provided, will be built by the Dixie Coal & Lumber Company at Peavine, Tenn.

A traction line to be operated by electric power will be built for the Atlanta & Northeastern Railroad Company, recently organized in Atlanta, Ga., which will run as far as Cumming, Ga.

Bids will be taken until December 7 on equipment for the new water works system at Timmonsville, S. C., including a steam plant of 100 hp., fire service pump, air compressor, &c., together with a steel tower and tank. Specifications can be obtained by addressing the Commissioners of Public Works.

A new electric railway system will be built in Montgomery, Ala., and vicinity by the Alabama Traction Company, which has been organized by Chas. G. Abercrombie of that place and others. Plans for power equipment have not yet been definitely determined upon.

The Lexington Railway Company, Lexington, Ky., is having plans prepared for a new power house, details of which have not been completed.

The Northwest

ST. PAUL, MINN., November 21, 1910.

With the approach of winter there is more of a rush than ever to get construction work finished, machinery installed, heating plants in operation and other arrangements made in preparation for cold weather; consequently the efforts of contractors and dealers have been more largely given of late to the completion of work in hand than to the ordering or placing for future delivery of additional equipment.

Interests identified with the Great Northern Power Company, Duluth, are planning the construction of a new traction line traversing the iron ranges, to be known as the Mesaba Electric Railway. Oscar Mitchell, secretary of the Great Northern Power Company, is president of the new organization.

A new water works station is to be built at Eveleth, Minn., and a pumping unit of 2,000,000 gal. daily capacity purchased, together with other apparatus.

The contract for furnishing the new pumping engine to be installed in the municipal water works at Owatonna, Minn., has been placed with the Laidlaw-Dunn-Gordon Company, Cincinnati. Some additional equipment is to be purchased by or before spring.

A three-stage centrifugal pump has been ordered from the Byron Jackson Machine Works, San Francisco, Cal., for installation in the municipal pumping station at Red Wing, Minn.

Provision is being made for a system of modern water works at Ardmore, S. D., including a gas engine driven pumping unit and an elevated steel tank serving the distribution mains.

The Imperial Iron Works, Duluth, Minn., now has under way an addition to its plant 60 x 160 ft., which will considerably extend its facilities for production in the various lines of the company's activity.

The Missoula Copper Company, Wallace, Idaho, is erecting a new compressor building and repair shop. A large air compressor has been ordered and will be installed about January 1.

Equipment will be purchased within the next few months for the new electric line to be built by the Billings Traction Company, Billings, Mont. R. D. Long, general manager of the Muskogee Electric Traction Company, Muskogee, Okla., is one of the incorporators and will select the apparatus to be used.

The Athol Water & Light Company, Athol, Idaho, has been organized to establish a public service plant.

N. E. Wayland, Crawford Falls, Idaho, will install an electric power plant at Tamarack, Idaho, for a company now being formed there.

North Pacific Coast

SEATTLE, WASH., November 18, 1910.

With the large number of clearances this fall from ports on the North Pacific Coast and the consequent periods during which vessels from all parts of the world were lying at the various docks, there has been an amount of marine work which materially helps to swell the aggregate volume of business of the metal working industries. The only cloud upon the horizon has been the renewed threatening of labor troubles, which, however, were effectually averted before becoming serious.

The Lewiston-Clarkston Improvement Company, Clarkston, Wash., is about to enter upon the contemplated remodeling and enlargement of its power system, including the installation of additional steam-driven electric units.

The Seattle Car Mfg. Company, whose main offices are in the Alaska Building, Seattle, has had a large output this year of logging trucks and flat cars for use in transmitting timber. By another season its facilities will need to be considerably extended.

It is reported from Concully, Wash., that the Okanogan Irrigation & Improvement Company is planning heavy expenditures for development work in that section which will include the use of large pumping units, electrically operated.

The city of Centralia, Wash., has completed arrangements for the installation of a municipal power plant, including a battery of boilers and steam turbine sets aggregating 1000 kw. in capacity, together with auxiliary apparatus.

The Globe Mill Company, Globe, Wash., is planning to rebuild the plant recently destroyed by fire.

The Hunter Mfg. Company, Seattle, is making a feature of the manufacture of models and experimental work on machinery. A full line of engineers' supplies, instruments, &c., is also carried.

The Crook County Water, Light & Power Company, Redmond, Ore., is preparing to build a new electric generating plant in that vicinity by or before next spring.

An electric lighting plant is being installed by the Crown Lumber Company at its mills in Mukilto, near Everett, Wash., and other improvements are to be made later.

An engineer engaged by the city for the purpose has prepared plans and estimates for a system of municipal water works at North Bend, Ore.

The United Copper Company, Chewelah, Wash., has recently installed considerable new machinery, including an ore crusher, jig, air compressor, hoist, &c.

A manufacturing plant will be built at Chehalis, Wash.,

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by the Pacific Tank & Silo Company, recently organized, one of the incorporators of which is W. A. Bricker, of the Summit Mill Company, Seattle.

The Washington Water Power Company, Spokane, Wash., has completed at Wardner, Idaho, a new transformer station of 1500 kw., to furnish power for operating motors in the mine and ore handling plants of the Bunker Hill & Sullivan Mining Company.

Farther Central West

OMAHA, NEB., November 21, 1910.

Conditions all through this section of the country have become more favorable from one week to another, and the present month, taken in its entirety, can hardly fail to show an excellent aggregate of buying, both for present and future needs.

The installation of a pumping plant and modern system of water works is under consideration at Afton, Iowa. Gasoline engine or electric motor-driven units will probably be utilized.

The plant of the Oelwein Light, Heat & Power Company, Oelwein, Iowa, will be remodeled and enlarged, having been acquired by a newly organized company, of which C. B. Chambers, Oelwein, is an officer.

The Northwestern Zinc Company, Dubuque, Iowa, has started work on the foundations of a large concentrating plant at Day's Siding, Ill.

A hydroelectric plant will be constructed by the city of Gunnison, Colo., on the Gunnison River, for the operation of its power and pumping station, with consequent enlargement of both the lighting and water distribution systems now under the control of the municipality.

A new shaft house will be built and operating machinery installed by the Gilpin-Orion Coal Mining Company, Central City, Colo.

The authorities at Wynot, Neb., have had plans for a pumping plant and water works system prepared by Arnold C. Koenig, a consulting engineer of Omaha.

The Grasselli Chemical Company, Park City, Utah, is erecting a new mill, with a daily capacity of 125 tons, as an addition to its present plant.

The Chief Mining Company, Eureka, Utah, has installed a new hoisting plant and will enter upon further improvements a little later on.

Plans are now being completed by the W. K. Palmer Company, Kansas City, for a municipal power and pumping station at Norfolk, Neb.

The Farley-Loetscher Company, Dubuque, Iowa, is planning the erection of a branch manufacturing plant and warehouse at Des Moines, Iowa.

The construction of a municipal pumping plant is being urged at Massena, Iowa.

The Potthast Gas Machine Company, Greeley, Colo., has been incorporated with $100,000 capital stock. The company is considering the erection of a factory, but a definite location has not been decided upon. The company will manufacture a machine for making gas from low gravity gasoline for heating and lighting purposes.

Government Purchases

WASHINGTON, D. C., November 21, 1910.

Bids will be opened by the Constructing Quartermaster, Fort Leavenworth, Kan., December 5, for furnishing and delivering f.o.b. Fort Leavenworth, one 40 to 45 ton standard gauge locomotive.

The Paymaster General, Navy Department, Washington, will open bids December 6, under schedule 3072, class 51, for one locomotive wrecking crane schedule 3073, class 52, one swing lathe; class 53, two swing lathes; schedule 3074, class 55, one universal milling machine and one tool room engine lathe; schedule 3075, class 61, one vertical stranding machine.

Bids were opened by the Bureau of Supplies and Accounts, Navy Department, Washington, November 15, as follows:

Class 1.—Two Hartness flat turret lathes—Bidder 91, Jones & Lamson Machine Tool Company, Springfield, Vt., $1536; 176, Warner & Swasey Company, Cleveland, Ohio, informal.

Class 21.—Two steam deck winches—Bidder 78, Hyde Windlass Company, Bath, Maine, $800; 106, Lidgerwood Mfg. Company, New York, $789.50 and $803.70; 170, Williamson Brothers Company, Philadelphia, $625.

The Isthmian Canal Commission, Washington, opened bids November 11, under Canal circular 611 A, as follows:

Class 1.—Two 75-kw. motor generator sets—Bidder 7, Fort Wayne Electric Works, Fort Wayne, Ind., $5186; 8, General Electric Company, Schenectady, N. Y., $5110; 24, Westinghouse Electric & Mfg. Company, Baltimore, Md., $4871.

Class 2.—One turret lathe—Bidder 13, Manhattan Supply Company, New York, $2082.50 and $2567.50, parts extra; 14, Manning, Maxwell & Moore, New York, $2800 and $2500, parts extra; 16, Niles-Rement-Pond Company, New York, $4760 and $5162.

Class 3.—One milling machine—Bidder 2, Brown & Sharpe Mfg. Company, Providence, R. I., $2304.82, $2836.37 and $2610.87; 4, Cincinnati Milling Machine Company, Cincinnati, Ohio, $2364.65 and $2633.65, $2675.65, $2608.65, $2710.65, $2675.65 and $2790.65; 11, Ingersoll Milling Machine Company, Rockford, Ill., $3089; 14, Manning, Maxwell & Moore, New York, $2320 and $1890.

The Secretary of the Navy, Washington, opened bids November 12 for completing the power plant at the United States Naval Academy, Annapolis, Md. The various alternate bids are as follows:

The Camden Heating Company, Camden, N. J.—Item 1, $93,644; item 2, $21,500; item 3, $1325; item 4, $400, and item 5, $925. Albert & J. M. Anderson, Boston, Mass., $5310 for switchboard and $5425 for making certain changes; D'Olier Engineering Company, Philadelphia, Pa.—Item 1, $36,293; item 2, $1800; item 3, $1350; item 4, $285, and item 5, $1300. John W. Danforth Company, Rochester, N. Y.—Item 1, $92,481; item 2, $1700; item 3, $1300, and item 5, $1700. Evans Admiral Company, New York—Item 1, $90,545; item 2, $1500; item 3, $1250; item 4, $60, and item 5, $1000.

Judicial Decisions of Interest to Manufacturers

ABSTRACTED BY A. L. H. STREET.

Duty of Employer to Inspect Appliances.—The general rule with respect to the installation and use of a given machine or other article is that an employer discharges his duty of exercising ordinary care to provide a reasonably safe place to work if he buys the machine from a reputable manufacturer and uses ordinary care in inspecting it before using. But his right to assume that the appliance is safe is not absolute in the sense that it absolves from all duty of reasonable inspection, nor in any case does it relieve from an inspection as to defects discernible by superficial examination. In a suit against an iron works company for death of a workman caused by explosion of a valve in an air compression line, which was defective on account of blowholes in the iron, it was a question for the jury to decide whether the company would have discovered the defect by using ordinary care and whether ordinary care required an inspection of the interior of the valve, which was 12 in. long and 5 in. in diameter, and which was bought from a reputable dealer. The blowholes were concealed by the paint on the outside of the valve, but were visible on the inside when the seat was removed. The jury found for plaintiff.—United States Circuit Court of Appeals, Sixth Circuit, Boyle *vs.* Petroleum Iron Works Company, 179 Federal Reporter 433.

Form of Orders to Employees.—An order to a workman to do an act, as affecting the employer's liability for injury to him while doing it, need not be in set words; it may be inferred from any words or acts reasonably justifying an inference of such order.—Alabama Supreme Court, Republic Iron & Steel Company *vs.* Williams, 53 Southern Reporter 76.

Right of Workmen to Rely on Safety of Appliances.—A workman is entitled to rely upon the assumption that machinery and appliances furnished him by his employer are safe and suitable, and need not even use ordinary care to ascertain if they are so, but if he knows that they are not, or if it is obvious or apparent that they are not, and he uses them and is injured, he may be held, as a general rule, to have assumed the risk, or to have been guilty of contributory negligence, precluding recovery for the injury.—South Carolina Supreme Court, Dover *vs.* Mills, 68 Southeastern Reporter 525.

Liability for Injury to Machinist.—A machinist while operating a machine drill with unguarded cogwheels, and while inspecting the lower part of the machine, slipped without apparent cause, and thrust his hand into the cogwheels, resulting in injury. Held that the slipping on the floor, and not the unguarded condition of the wheels, was the primary cause of his injury, relieving the employer from liability for the injury.—New York Supreme Court, Appellate Division, Second Department, Valentine *vs.* Garvin Machine Company, 123 New York Supplement 950.

Presumption in Favor of Employees Killed.—In a suit against an employer for death of an employee in the line of his work, it will be presumed that decedent used ordinary care for his own safety, in the absence of a showing to the contrary.—Springfield, Mo., Court of Appeals, McMenamy *vs.* Scullin-Gallager Iron & Steel Company, 130 Southwestern Reporter 357.

Liability for Injury to Operator of Rivet Heater.—One employed in a boiler factory to heat rivets on an oil heater is entitled to recover from his employer for injuries caused

by the blowing out of a valve stem, which permitted burning oil to escape, igniting his clothing, unless he knew of the defective condition which caused the accident. The award of $22,895 was not excessive recovery since the employee's face, neck, chest and arms were badly burned.—Rhode Island Supreme Court, Carr *vs.* American Locomotive Company, 77 Atlantic Reporter 104.

Liability of Employer for Injuries Caused by Latent Defects.—An employer is presumed to know of defects in appliances furnished his workmen, though the defects be latent, requiring him to disprove such knowledge in a suit by an employee to recover damages for injuries caused by a defect.—South Carolina Supreme Court, Dixon *vs.* Chiquola Mfg. Company, 68 Southeastern Reporter 643.

Care Required of Foremen.—A foreman in a manufacturing establishment, on learning of the existence of electric currents in the ground where men are at work, caused by a defective wire, must, regardless of any other matter in which he is engaged, take immediate action to remove the danger. If he fails to do so and permits employees to continue their work there, the employer is liable for resultant injury to workmen.—St. Louis, Mo., Court of Appeals, Frazier *vs.* St. Louis Smelting & Refining Company, 130 Southwestern Reporter 485.

Liability for Negligence—Duty of Employer—Assumption of Risk by Employee.—It is negligence to omit to provide a device to prevent a belt shifting from a loose to a tight pulley, where such devices are generally used and no other reasonably safe means to prevent shifting have been adopted in the particular case. Where the operator of a machine is not required to keep it in repair he assumes such risks of injury from it as ordinarily prudent persons of his intelligence and occupation should appreciate. On the question whether an employee assumed the risk of injury from unguarded machinery, the nature of his previous employment, his mechanical experience, his opportunities to learn by observation and experience, the equipment employed to prevent the occurrence which caused the injury, and his knowledge respecting such matters should be taken into consideration.—Colorado Supreme Court, Kent Mfg. Company *vs.* Zimmerman, 110 Pacific Reporter 187.

Employer's Liability for Injury Caused by Defective Appliance.—An employer is not liable for injury caused an employee by a defective appliance, unless negligent in failing to discover and remedy the defect.—Alabama Supreme Court, Tennessee Coal, Iron & Railroad Company *vs.* Harmes, 52 Southern Reporter 827.

Liability for Injury Inflicted by Employee.—An employee, under the control and management of an independent contractor, was his employee, though the employee's wages were paid by an iron company with which the contractor had dealings, and hence the company is not liable for injury to another employee of the contractor caused by the first mentioned employee's negligence.—Alabama Supreme Court, Woodward Iron Company *vs.* Brown, 52 Southern Reporter 829.

Employee's Rights Respecting Appliances.—An employer must furnish reasonably safe appliances. An employee directed to use any one of several trucks was not bound to inspect the one selected.—Washington Supreme Court, Graaf *vs.* Vulcan Iron Works, 109 Pacific Reporter 1016.

Contributory Negligence.—A machinist cannot recover from his employer for injury caused by the running of an overhead crane over his hand while he was descending from the runway, where he placed his hand on the track of the crane and failed to notice the moving of the crane, and where the operator was under his direction and the direction of another employee, at whose instance the crane was moved.—United States Circuit Court, Eastern District of Pennsylvania, Gallagher *vs.* Worth Brothers Company, 179 Federal Reporter 1016.

Abandonment of Invention to the Public.—Where a device was in commercial use for more than four years before the inventor conceived an additional element and applied for a patent, the invention was abandoned to the public, so far as it embodied the device before that element was added.—United States Circuit Court of Appeals, Seventh District, Star Mfg. Company *vs.* Crescent Forge & Shovel Company, 179 Federal Reporter 856.

Employers' Liability Under Kansas Factory Act.—An establishment wherein railroad iron, old waste iron and scrap iron of every description is cut into lengths by means of alligator shears and operated by power, to meet standing specifications of mills which purchase the product, is a "manufacturing establishment" within the meaning of the factory act.—Kansas Supreme Court, Casper *vs.* Lewin, 109 Pacific Reporter 657.

Strike Insurance Contract.—A policy of insurance against loss on account of strikes by employees was based on an application which contained the question, "Are you a union shop, and, if so, how many and what unions do you recognize?" The answer was, "Only so far as the National Founders' Association and National Metal Trades Association." In answer to another question requiring insured, if it conducted a nonunion shop, to state the different lines of craftsmen employed and the number, insured stated that it was nonunion in certain departments, and gave the number of employees, and, in reply to a further question as to what national and local organizations it was a member of, gave the two first-named associations and their local branches. Held, the insured represented only that it was a union shop and recognized unions only through its membership in the two associations referred to, and not that it was no more a union shop than such associations. The insurance company having accepted and retained the premium, knowing that the conditions in the warranty in the application had not in fact continued throughout the entire period after the application, and, before delivery of the policy, it waived insured's failure to notify it of the changed conditions. The policy provided for an indemnity not exceeding $50,000 against all direct damage from suspension of operations caused by strike, and that, if a strike entirely suspended the production of goods, insurer should be liable for loss of net profits and for fixed charges, not exceeding $166 2-3 per day for each working day, and that, in case a strike prevented the making of a full daily average production of goods, insurer should be liable for that proportion of the net profits and fixed charges, which the production so prevented from being made "bears to the average daily product," not exceeding the amount insured. It further provided that the average daily product should be determined from the amount of goods last produced during a period of 12 months' full work previous to the strike, and that losses should be computed from the day of the strike to such a time as insured should be able to produce the former daily average, &c. Held, that in case of partial suspension of operation the net profits of the preceding year furnished the basis of estimate, as in case of entire suspension, and that insurer was liable for such proportion of the net profits and fixed charges as the production prevented bore to the average daily production.—Connecticut Supreme Court of Errors, Buffalo Forge Company *vs.* Mutual Security Company, 76 Atlantic Reporter 995.

Iron and Industrial Stocks

NEW YORK, November 23, 1910.

The stock market has displayed considerable strength and prices of securities have steadily moved upward from the time of last week's report. The advance was especially noteworthy in Can preferred, Bethlehem preferred, Pump common, Steel common and General Electric. The quiet condition of the iron trade is apparently without effect on those interested in stock market movements. The range of prices on active iron and industrial stocks from Thursday of last week to Tuesday of this week was as follows:

Allis-Chalm., pref..	32 - 34	Railway Spr., com.	34½- 36
Beth. Steel, com...	32 - 33	Railway Spr., pref.....	97¼
Beth. Steel, pref...	60⅛- 63	Republic, com.....	33⅞- 35¼
Can, com.....	9¾- 10⅞	Republic, pref.....	97½- 98
Can, pref.....	75½- 82¼	Sloss, com.....	51 - 52
Car & Fdry, com..	54¼- 55½	Pipe, com.....	16 - 17⅛
Car & Fdry, pref..114¼-115		Pipe, pref.....	58 - 58⅝
Steel Foundries...	47¼- 48½	U. S. Steel, com...	78⅞- 81⅝
Colorado Fuel.....	34 - 36⅝	U. S. Steel, pref...117⅜-118⅜	
General Electric...153 -156½		Westinghouse Elec.	71 - 73
Gr. N. ore cert....	59½- 60½	Am. Ship, com.....	78
Int. Harv., com....112 -113¼		Chi. Pneu. Tool...	40½- 40⅝
Int. Harv., pref.....121¼		Cambria Steel.....	43 - 44¼
Int. Pump, com...	42 - 45	Lake Sup. Corp....	26¼- 28
Int. Pump, pref...	84⅜- 85⅜	Pa. Steel, pref....104½-105	
Locomotive, com...	39 - 40⅝	Crucible St., com..	12⅞- 13¼
Locomotive, pref.....106¾		Crucible St., pref..	78 - 79⅞
Pittsburgh St..pref.100½-101		Harb.-W. Ref., com.	32 - 32¼
Pressed St., com..	32¾- 35	Harb.-W. Ref., pref.....	95
Pressed St., pref..	96 - 96⅞		

Dividends.—The American Brake Shoe & Foundry Company has declared the regular dividends of 7 per cent. per annum on the common and preferred stocks, payable in quarterly installments of 1¾ per cent. The first quarterly payment is due December 31.

The Ingersoll-Rand Company, 11 Broadway, New York, has acquired an important addition to its manufacturing interests in the purchase of the property and business of the A. S. Cameron Steam Pump Works, whose plant is located at the foot of East Twenty-third street, East River, New York. The pump company is enjoying an active trade and its plant is running on full time.

The Carnegie Steel Company has established a suboffice in Syracuse, N. Y., at 608 Kirk Building, to be under the general supervision of the Buffalo sales office. This company also has a salesman located in Rochester, reporting to the Buffalo district office.

Trade Publications

Oil Engine.—De La Vergne Machine Company, foot of East 138th street, New York City. Bulletin No. 101. Illustrated. Gives general description and specifications for the type F H De La Vergne oil engine. This new model is said to possess the mechanical perfection of the company's H A engine and to excel in thermal efficiency any practical engine heretofore obtainable.

Insulating Materials and Packings.—Robert A. Keasbey Company, 100 North Moore street, New York City. Catalogue. Calls attention to a line of pipe and boiler coverings made from insulating material containing 85 per cent. of magnesia, the remainder being asbestos and cork. These include sectional and block coverings, asbestos molded sectional coverings and blocks, air cell covering and board constructed of successive layers of corrugated asbestos paper with intermediate air spaces, &c.

Vises and Machinists' Tools.—Athol Machine Company, Athol, Mass. Catalogue No. 30. Size 4¾ x 7 in.; pages 80. Illustrated. Lists a number of different styles of vises, grindstones and bench grinders and machinists' tools, such as calipers, dividers, steel rules, straight edges, squares, bevels, screw pitch gauges, wrenches, clamps and levels.

Grinding and Polishing Machinery and Engines.—J. C. Born & Brother Machine Works, Belleville, Ill. Catalogue. Illustrated. Lists a line of grinding and polishing machines and horizontal and vertical engines. These machines are so designed that they may be driven by a belt from an overhead countershaft, or if desired the belts can be run up through the columns from below. The vertical engines are built in four sizes ranging from 4 to 10 hp. and the horizontal models in three sizes ranging from 20 to 40 hp.

Iron Pipe and Sugar Mill Machinery.—Reading Iron Company, Reading, Pa. Three circulars. List various sizes and shapes of iron manufactured by this company, wrought iron pipe, line and drive pipe, lap welded well casing and boiler tubes, with tables giving the weights and thicknesses of the different sizes. The last circular shows a nine-roller sugar cane mill and crusher driven by one engine.

Couplings.—Falls Rivet & Machinery Company, 206 Fulton street, New York. Folder. Illustrated. Covers a line of patent compression couplings. The various types include single and double compression flange couplings and two styles of compression clutch shell couplings. The special advantages claimed for these couplings are that keys and their seats are done away with, the shafts do not have to be centered if there is a slight variation in diameter, facing the couplings is eliminated and a gripping power is obtained which it is stated will break the shaft before slipping takes place.

Power Pumps.—The Buffalo Steam Pump Company, Buffalo, N. Y. Catalogue No. 229. Size 6 x 9 in.; pages 64. Illustrated. Concerned with a line of single, duplex and triplex power pumps for general water supply, boiler feeding, tank work, mine pumping, &c. Space is also given to a triplex hydraulic pump, triplex automatic house pump and starting devices, valves, gauges, revolution counters and pressure regulators.

Feed Water Heater.—National Pipe Bending Company, 156 River street, New Haven, Conn. Booklet. Treats of the National feed water heater for boilers from 5 to 4000 hp., which consists of one or more coils of seamless drawn tubing inclosed in a cast iron or steel shell to which exhaust steam is admitted, heating the water as the latter passes through the tubing. Directions for erecting the heater and its use in condensing steam plants are included.

Electric Motors and Motor Driven Machines.—The Mechanical Appliance Company, Milwaukee, Wis. Two pamphlets and a bulletin. Illustrated. The first is devoted to the type K induction motors, the special features of which are high starting and pull out torque, liberal overload capacity, low temperature rise and good speed regulation. The second pamphlet calls attention to the Watson grinders and buffers, which have been developed to meet the call for medium sized equipments. The machines making up this line are a pedestal grinder, a bench buffer and a bench grinder. Bulletin R-1 describes the Ajax electric riveting machines, which were illustrated in *The Iron Age* July 14, 1910.

Reflectors and Shades.—H. G. McFaddin & Co., 33 Warren street, New York City. Pamphlet. Refers to a line of reflectors and shades for electric, gas and kerosene fixtures made of a special material called Emeralite, which consists of a pure white opal glass plated outside with a rich emerald green glass, the two being carefully annealed. The results are included of comparative tests made with an Emeralite reflector and a prismatic extensive shade on a 60-watt, 110-volt Mazda lamp, in which the former showed a higher efficiency.

Bell Ringing Transformers.—Edwards & Co., Exterior and 140th streets, New York City. Folder. Refers to a line of self-contained transformers for operating small bells, annunciators and door openers from electric lighting circuits, thus avoiding the use of small dry batteries. They are made with a laminated steel core and the insulation is tested with an alternating current of 2500 volts, the whole being encased in a japanned iron shell.

Electrical Machinery and Appliances.—Crocker-Wheeler Company, Ampere, N. J. Four bulletins. No. 120, superseding No. 100, contains considerable useful information on direct current motor design and more especially regarding the company's form I machines. No. 122, superseding No. 101, deals with the form D belt type direct current machine and describes the special features of its design, which are the construction of the magnet frame, the armature and commutator, the design of the field coils and the arrangement of the brush rigging. No. 123, superseding No. 89, refers to a line of adjustable speed motors, which range from ⅓ to 32 hp. No. 125 is concerned with the Remek transformers for light and power service.

Automatic Hydraulic Vacuum Pump.—Bishop & Babcock Company, Cleveland, Ohio. Folder. Calls attention to its Reliable automatic hydraulic vacuum pump, and shows how existing heating systems, either steam or hot water, can be converted into a practical and efficient vacuum system by this pump.

Pipe Vise and Bender.—Dandy Specialty Mfg. Company, 565 Van Buren street, Chicago, Ill. Folder. Deals with a combination pipe vise and bender. The jaws are curved at the ends so that the pipe can be easily bent without kinking.

Structural Steel.—Belmont Iron Works, Twenty-second street and Washington avenue, Philadelphia, Pa. Loose leaf catalogue. Contains a number of reproductions of photographs illustrating some of the various classes of work which this firm has designed, fabricated and erected. Among the contracts illustrated is the underbody shop of the Harlin & Hollingsworth Corporation, Wilmington, Del., which was illustrated in *The Iron Age* December 9, 1909.

Zinc Ore Separating.—The American Zinc Ore Separating Company, 55 Congress street, Boston, Mass. Pamphlet. Refers to the separation of zinc from complex sulphide ores and especially that known as blackjack. Various methods for handling the different kinds of ores are described.

Lifting Magnets.—The Cutler-Hammer Clutch Company, Milwaukee, Wis. Folder. Relates to the first magnet made by this company, which was shipped in February, 1907, to the Donora Works of the Carnegie Steel Company. An illustration shows the magnet lifting 2080 lb. of sand cast manganese iron pigs, which is claimed to be the record at the time this magnet was sold. The special features of the present type of Cutler-Hammer lifting magnet are briefly touched upon. A short description of the original magnet appeared in *The Iron Age* September 26, 1907.

Feed Water Heater.—W. D. Garrett & Co., 136 Liberty street, New York City. Folder. Illustrated. Deals with the Garrett exhaust muffler, oil separator, return tank filter and feed water heater, which combines in one all the essential features of five separate appliances formerly used.

Boilers and Grates.—James Beggs & Co., 109 Liberty street, New York City. Two illustrated catalogues. Special catalogue No. 30 pertains to the Directurn horizontal return tubular steam boiler. The other catalogue describes the McClave grate for burning all grades of hard or soft coal under boilers and the Argand steam blower for furnishing blast to burn the cheaper grades of hard and soft coal.

Aerial Wire Rope Tramways.—Broderick & Bascom Rope Company, St. Louis, Mo. Catalogue. Illustrated. Points out the advantages of using the B. & B. automatic loader system of aerial tramways of the continuous double rope type, in which the buckets or carriers are permanently attached to an endless rope moving constantly in the one direction. The carriers in which the material is transported travel on parallel stationary track cables supported at intervals by intermediate towers, and the motion is transmitted to them from the small endless pulling rope to which they are attached by a patented tramway clip. The buckets are automatically loaded at the loading station, and upon arriving at the discharging station the bucket engages a tripping device which automatically releases the bucket latches, allowing the load to be discharged.

Oil Cups.—The Economy Oil Cup Company, Montgomery Building, Augusta, Ga. Pamphlet. Devoted to the Economy oil cup for lubricating electric and street railroad cars. *The Iron Age*, August 4, 1910, contained an illustrated description of this oil cup.

Brick Press.—Chisholm, Boyd & White Company, Fifty-seventh and Wallace streets, Chicago, Ill. Catalogue No. 20. Illustrates the Boyd brick press and accessories for the manufacture of pressed brick and also contains a few suggestions concerning the design and the equipment of brick plants. These presses are made in three styles, using 2, 4 and 6 molds, respectively, and having outputs of 10,000, 20,000 and 30,000 bricks per day. Space is given to a self-contained dry pan and a clay mixer and feeder.

Horizontal Center Crank Engines.—B. F. Sturtevant Company, Hyde Park, Mass. Bulletin No. 132. Illustrated. Describes a type of horizontal center crank engines which were originally designed for direct connection to the fans and elec-

tric generators built by this company and embody a number of special features in their design and construction. They are built for both throttling and automatic regulation for high, medium and low pressures, and are capable of continuous operation for long periods with but little attention.

Pneumatic Hammer Drills.—Sullivan Machinery Company, 150 Michigan avenue, Chicago, Ill. Bulletin No. 60-D. Illustrated. Pertains to the Sullivan hammer drills for mining and construction work. Shows the DA-21 air feed stoping drill, which is designed for use where the holes point upward and the cuttings run from the holes by gravity, and the DB-15 and the DB-19 hand drills. The advantage claimed for these drills is high speed

Electrical Machinery.—The General Electric Company, Schenectady, N. Y. Three illustrated bulletins. No. 4774, superseding No. 4534, deals with centrifugal air compressors for industrial air blast and exhauster service with pressures ranging from 0.75 to 4 lb. per sq. in. and capacities from 500 to 36,000 cu. ft. of free air per minute. No. 4775 describes the type K8 single-phase induction motors, designed for establishments which can secure only single-phase current. In general this motor is adapted to drive geared and belted machinery requiring constant speed with light or moderate starting torque. No. 4776 refers to the RB and RBO type for direct current generators for two and three wire systems.

Pulverizing Machinery.—The Raymond Brothers Impact Pulverizer Company, 520 Laflin street, Chicago, Ill. Catalogue No. 10. Illustrations and descriptive matter explain the operation of a line of pulverizing machines which will handle a great variety of material ranging from hay and bark to cement, zinc and marble.

Wire Rope Tramway.—A. Leschen & Sons Rope Company, 920 North First street, St. Louis, Mo. Illustrated pamphlet. Size 8½ x 11½ in.; pages 28. Relates to an aerial rope tramway carrying zinc ore from a point in Coahuila, Mexico, a distance of six miles, and delivering it in Texas. This tramway is of the builder's special automatic type and was adopted as the only practicable method of working the Mexican property, which was located about 100 miles from the nearest railroad, while the country lying between was of such a character as to make it impracticable to pack the ore on burros or handle it by any other means of transportation.

Belt Dressing.—Cling-Surface Company, 1032 Niagara street, Buffalo, N. Y. Circulars. Deal with the use of Cling-Surface for keeping leather and cotton belts and rope pliable and waterproof, preventing all drying or cracking and stopping the slipping of the belts. A notable Australian installation where this compound was used to enable an English system rope drive to deliver its maximum horsepower even though the slack portions have sagged and run between the driving ropes was illustrated in *The Iron Age* January 27, 1910.

Draft Gear.—The T. H. Symington Company, Baltimore, Md. Catalogue A. Illustrated. Concerned with the Farlow draft gear, the fundamental idea of which is to eliminate the coupler yoke and rivets and at the same time provide a direct distribution of the pulling and buffing shocks to the car underframing at six or eight places, instead of concentrating the stress at two points on the center sills.

Air Compressors.—The Platt Iron Works Company, Dayton, Ohio. Bulletin No. 549. Illustrated. Describes the Smith-Vaile air compressors for operation either by direct connection to steam engines or by belting. Brief specifications of the various compressors making up the line are included and space is given to a number of pumps for different uses.

Woodworking Machinery.—The Ober Mfg. Company, Chagrin Falls, Ohio. Catalogue. Shows a number of lathes for turning odd shapes, sanders, shapers and other woodworking machines. Two types of sanders are described and space is given to a number of saws and a combination boring and chucking machine.

Mine Cars and Wheels.—Hockensmith Wheel & Mine Car Company, Penn Station, Pa. Catalogue. Describes and illustrates a line of mine car wheels and a number of different types of cars. Space is also given to various mining and mine car accessories.

Windmill and Pumps.—Baker Mfg. Company, Evansville, Wis. Catalogue No. 39. Size 5½ x 7¾ in.; pages 164. Illustrates the Monitor line of windmills, steel towers, pumps and gasoline engines. The windmills are made with both steel and wood vaneless wheels for pumping and power purposes. The different style of towers include three and four post windmill towers and four-post towers for tanks. The line of pumps includes lift and force pumps, underground force pumps, windmill regulating pumps and a number of small types for household use. The gasoline engines are of the four-cycle type and are intended for use in connection with pumps, feed grinders and saws.

Unions.—The E. M. Dart Mfg. Company, 136 Clifford street, Providence, R. I. Folder. Illustrated. Refers to a number of different types of unions and flanges, which are made in all the usual styles. The special features are the use of two bronze seats to prevent corrosion and malleable iron pipe ends and nuts to secure strength and durability.

Clutch Pulleys and Cut-off Couplings.—Allis-Chalmers Company, Milwaukee, Wis. Pamphlet No. 4023. Deals with the Allis-Chalmers friction clutch, which is made in sizes adapted for use in any place where power is employed. The special features of the clutches, such as ease of adjustment, maximum power transmission, freedom from repairs and continuous service, are discussed.

Flare Lights.—International Marine Signal Company, Ltd., Ottawa, Canada. Pamphlet. Describes and illustrates the Willson flare light, which burns acetylene gas and is especially designed for use in connection with all kinds of outdoor construction work and also in mines and tunnels. The different sizes of light are shown and instructions are given for its operation.

Friction Clutches and Couplings.—American Twist Drill Company, Laconia, N. H. Catalogue No. 20. Illustrates the Worrall friction clutches, pulleys and couplings, which are built on the principle of a solid flange coupling with the additional advantage of instant connection and disconnection in a number of sizes transmitting from 1 to 2000 hp. The construction of the clutch is described at length and directions given for its operation. Space is also given to an improved friction countershaft and a jack and quill shaft.

Automatic Dovetail Glue Jointer.—Linderman Machine Company, Muskegon, Mich. Bulletin. Describes the operation and advantages of using an automatic dovetail glue jointer, which combines all the operations necessary to complete a piece of work, including sizing the finished panel to the correct width.

Emery Wheel Machinery.—Joseph T. Ryerson & Son, Sixteenth and Rockwell streets, Chicago, Ill. Illustrated catalogue. Relates to a line of emery wheel machinery which includes bench and stand grinding machines, wet tool grinders, an automatic planer knife grinder and two styles of buffing lathes. In addition to the descriptions of the machines, space is also given to a discussion of the characteristics of emery wheel machinery and the use of emery wheels.

Valves.—Eddy Valve Company, Waterford, N. Y. Catalogue C. Size 5¼ x 8¼ in.; pages 302. This is the company's 1910 catalogue, describing and illustrating gate valves, sluice gates; check, foot and air valves, indicator posts, filtration specialties, and fire hydrants. The gate valves have either taper or parallel seats and are suitable for light, medium, heavy, extra heavy and hydraulic pressures.

Foundry Supplies.—J. S. McCormick Company, 2428 Railroad street, Pittsburgh, Pa. Circulars. Concerned with various foundry supplies, such as rapping plates, lifting screws, fillets, gaggers, shop pans, tote boxes and steel barrels.

Personal

Benjamin Talbot, Middlesbrough, England, is making a business trip to the United States.

Wilhelm Ohl, who is connected with the Allgemeine Elektricitäts Gesellschaft, Berlin, Germany, has returned home after a tour of the United States occupying several weeks.

Paul Koning has resigned as president of the New York Metal Exchange, and Vice-President James E. Pope will be acting president until the next annual election. Mr. Koning has been resident partner in New York of Brandeis, Goldschmidt & Co. of London. He will leave for Europe shortly to represent important American metal interests.

Capt. Godfrey L. Carden, who has been in the Behring Sea patrol service since early in the year, commanding the United States steamer Manning, is in New York and Washington on a brief leave of absence.

Walter Brinton, superintendent of the manganese steel department of the Taylor Iron & Steel Company's plant at High Bridge, N. J., since 1895, has resigned, and has become consulting engineer for the Edgar Allen American Manganese Steel Company, which is manufacturing manganese steel at Chicago Heights, Ill., and at New Castle, Del. Mr. Brinton's headquarters will be at the New Castle plant.

Charles M. Jarvis has been elected president of the American Hardware Corporation, New Britain, Conn., to succeed the late Philip Corbin. Charles H. Parsons has been elected to succeed Mr. Jarvis as first vice-president. Mr. Jarvis was largely instrumental in the organization of the corporation in 1902. He had been for a number of years president of the Berlin Iron

Bridge Company, and later was vice-president of the American Bridge Company. Mr. Parsons has been connected with P. & F. Corbin for over 37 years, and has been second vice-president of the American Hardware Corporation. Philip Corbin, Jr., grandson of Philip Corbin, has been elected a director of the American Hardware Corporation.

Andrew Carnegie, according to an announcement made by President Frew of the Board of Trustees of the Carnegie Technical Schools at Pittsburgh, celebrated his seventy-fifth birthday last week by giving $3,500,000 to that institution. Of this amount $1,500,000 will be at once available for buildings, while $2,000,000 will be applied to endowment.

D. H. Creider, formerly in charge of the employing bureau of the Westinghouse Companies, Pittsburgh, Pa., has been elected secretary of the Manufacturers' Association of Pittsburgh.

Chas. M. Bigger, formerly with the Firth-Sterling Steel Company, has been appointed sales manager at Cincinnati, Ohio, for the Vanadium Alloys Steel Company, Latrobe, Pa., manufacturer of Red Cut high speed steel, and has opened offices in the Mercantile Library Building.

F. G. Bolles, commercial engineer of the Allis-Chalmers Company, has resigned to devote his entire attention to the Reliance Engineering & Equipment Company, 1417-19 Majestic Building, Milwaukee, Wis., in which he has an equal interest with C. A. Tupper and others. The company, which is taking on a number of additional exclusive agencies, will remove December 1 to offices 415, 416 and 417 Engineering Building, and considerably extend the scope of its operations.

R. B. Shaw has been appointed Cleveland, Ohio, manager of Hill, Clarke & Co., of Chicago, machinery merchants, to succeed S. E. Hale, who recently resigned to engage in a manufacturing business in Detroit. Mr. Shaw was formerly connected with Hill, Clarke & Co., but more recently has been sales manager of the machinery department of the Davis Sewing Machine Company, Dayton, Ohio.

Obituary

CHARLES E. PEASE, president of the Buckeye Iron & Brass Works, Dayton, Ohio, since its organization in June, 1876, died November 8, aged 74. As a young man he worked in a machine shop at Dayton, and from the shop entered the University of Wisconsin. Leaving school in 1859 he returned to Dayton to assist his father in the management of a flour mill. Later he engaged in a similar enterprise with his brother. A residence of several years in the South was followed by his return to Dayton in 1870, when he purchased an interest in the metal working firm of Hoglen & Griffen, which afterward became Hoglen & Pease. The firm continued until 1876, when Mr. Pease purchased his partner's interest. The Buckeye Iron & Brass Works, which was then formed, has developed into one of Dayton's prominent industries. For 12 years Mr. Pease was a member of the Dayton City Council. He is survived by his widow and a son, Edward Pease.

RALPH S. BUCK, vice-president and manager of the Bridge & Beach Mfg. Company, St. Louis, Mo., died November 11, aged 50 years. He was the son of Charles H. Buck, the founder of the Buck's Stove & Range Company, and entered the employ of his father's firm in 1877, being elected vice-president four years later. He resigned in 1888 and became identified with the Bridge & Beach Mfg. Company. In 1899 he was elected second vice-president of this company and later vice-president and manager. At the time of his death he was chairman of the Executive Board of the National Association of Stove Manufacturers and a member of the Conference Committee of the Stove Founders' National Defense Association.

HARRY B. HUMPHREY of Humphrey & Sons, Joliet, Ill., manufacturers of wire mill machinery, well known in the Western foundry and machinery trades, died November 15, aged 46 years. He was shot in the latter part of October while guarding employees of his firm against rioting molders who were on a strike.

EDWIN J. HULBERT, who died recently at Rome, Italy, was a prominent figure in Lake Superior copper mining for many years. He was the discoverer of the Conglomerate lode and originally purchased from the Government the property now owned by the Calumet & Hecla Mining Company. He put down the first successful vertical shaft in the Lake Superior copper district, and was in many respects a remarkable miner. Owing to financial reverses he left the copper country and had lived in Italy for 30 years. He was born in 1829.

HARRY B. HUMPHREY, president of Humphrey & Sons, Joliet, Ill., died November 14, as the result of a bullet wound which he received October 25. He was born in Joliet, May 3, 1864, and when of sufficient age began work in his father's foundry and machine shop. In 1882 the father, Horace Humphrey, gave a third interest to each of his two sons, finally retiring in 1889. In recent years Harry B. Humphrey has been interested in the development and improvement of wire drawing benches and other equipment for the manufacture of wire products. On account of a strike in the shops the company was having difficulty with union pickets representing the Iron Molders' Union, and while protecting a party of workmen and escorting them to their homes Mr. Humphrey was wounded by one of the pickets. He leaves a widow, two sons and a daughter.

IRVING M. BEAN, one of the leading iron men of the Northwest, died at his home in Milwaukee, Wis., November 20, aged 72 years. He had been president of the Northwestern Iron Company about 40 years, and was also president and principal owner for a number of years of the Spring Lake Iron Company. Captain Bean was born in Essex County, N. Y., April 27, 1838, the family removing to Milwaukee in 1840. He was educated in Milwaukee schools and graduated from Carroll College. He attended law school at Poughkeepsie, N. Y., and was admitted to the bar in that State in 1860. Returning to Milwaukee in that year he began the practice of law, but continued only a few months until the outbreak of the Civil War. He enlisted as a private in the Fifth Wisconsin Infantry, but was soon appointed captain and served through the Peninsular campaign. Two brothers who enlisted with him lost their lives in the war. Returning to private life, he was elected president of a bank. In 1867 he became president of the Northwestern Iron Company, Mayville, Wis., an old charcoal enterprise, which was converted into a coke furnace. He disposed of his interest and retired about three years ago. His father had been the president of the Milwaukee & Lacrosse Railroad, one of the first important railroads built in Wisconsin. He was married in 1868, and his wife died in 1885. He leaves two sons and a daughter.

CHARLES H. TUCKER, secretary and treasurer of A. Leschen & Sons Rope Company, St. Louis, who died in Clifton Springs, N. Y., October 30, had been identified with the wire rope industry for 26 years. He was born in New York City 50 years ago. His first employment was with the Western Union Telegraph Company, and later he engaged in newspaper work. He entered the New York office of John A. Roebling's Sons Company in the eighties, growing steadily in that service until 1898 when he went with A. Leschen & Sons Rope Company, with whom he remained until his death.

A Pennsylvania Tribute to John Fritz

The Elliott Cresson Medal Presented to Him at a Dinner Given by the Manufacturers' Club of Philadelphia

Honor heaped upon honor has been the portion of John Fritz of Bethlehem, in a way that has been the lot of no other man among two generations of leaders in the American steel trade. The celebration of his seventieth birthday at South Bethlehem, Pa., in 1892, and of his eightieth birthday at New York in 1902 are well remembered, for they brought together two distinguished companies of engineers and manufacturers. The Bessemer Medal and the John Fritz Medal have expressed in lasting form the deliberate judgment of the engineering world concerning the place he has taken as a man and a worker. And now, added to all the rest, his own State of Pennsylvania has paid him a tribute that will long be memorable.

It was with the thought of making a distinctively Pennsylvania expression of regard for him that the Manufacturers' Club of Philadelphia recently asked Mr. Fritz to be the guest of honor at a dinner to be given at the club Thursday evening, November 17. What was intended as a tribute of the State and the locality broadened until the participants included a goodly number of Mr. Fritz's friends in the iron trade beyond the bounds of Pennsylvania, the company numbering about 175. The reception before the dinner showed to many who had not seen him in years that "Uncle John" Fritz bears remarkably the weight of his more than 88 years and of physical and mental labor that were literally herculean. Only a special endowment of vitality could have carried him through the successive functions which the enthusiasm of his friends has made such a conspicuous and heartening feature of his years of retirement.

Seated beside Mr. Fritz at the speakers' table was another Pennsylvanian to whom the iron industry of the country owes much—James M. Swank, general manager of the American Iron and Steel Association. Because of the large number of participants in the dinner some of the guests were given places in a room apart from the banquet hall. That the guest of the evening might have some part in the good cheer of this second party he was escorted from one room to the other in the midst of the dinner, his guide being a modern personator of Vulcan, whose entrance was announced by a herald. Mr. Swank was similarly piloted to the detached banquet room and presented to his friends there. For the after dinner programme all the guests found places in the main hall.

On the menu souvenir was the accompanying résumé of important events in Mr. Fritz's life.

Presentation of the Elliott Cresson Medal

Nathan B. Folwell, president of the Manufacturers' Club, introduced the speaking programme, presenting first John Birkinbine, who told in an entertaining way the story of the celebration of Mr. Fritz's seventieth birthday at South Bethlehem, Pa., September 28, 1892, when he was tried by the assembled engineers for "practicing engineering with a country school education as a basis." The trial ended in a verdict that "John Fritz was guilty of all the good things which had been stated concerning him," and sentencing him to "time"—a handsome cathedral chime clock being presented. Turning to some of the great developments in mechanical and metallurgical engineering which had come in the span of Mr. Fritz's life, the speaker said:

INDUSTRIAL CHANGES IN ONE LIFETIME.

Do we realize that the span of 88 years, which has been allowed John Fritz, covers the industrial and transportation development of the country and much of that of other nations; that the settled area of the then United States (in 1820) was 500,000 square miles (equal to Alaska), supporting a population of 11,000,000, while continental United States now has 3,000,000 square miles, settled by nearly 100,000,000 people? In Fritz's childhood the first railroads in the United States were laid, short lines whose rails were wood scantling capped with strap iron; and he passed his majority before the pioneer iron rail was rolled in this country. He was eight years of age when the first American locomotive, weighing six tons, was put in service; but he has seen the transportation system developed until the United States is gridironed by 334,000 miles of railroad, exclusive of what we recognize as trolley systems, and our steel works are turning out 3,000,000 tons of steel rails a year (many weighing 80 to 100 pounds per yard), while the locomotive industry has grown until one works, our "Baldwin," finished 2,666 in one year, some weighing with tenders as much as 300 tons each.

His earliest knowledge of iron production was of charcoal blast furnaces, stone stacks, located in or adjacent to forested areas for a supply of charcoal. They operated by cold blast furnished by wooden blowing tubs whose leather jacketed pistons received motion from weary water wheels and woke the forest echoes by their mournful screeching. The ore, dug near by, the flux and the charcoal were hauled by wagons or carts to the furnace, and the product of two or three tons per day reached distant markets by animal transportation. He was familiar with the forge, the refinery and slitting mill, also the early manufacture of nails by hand, and has seen all of the steps by which the iron and steel industry of the United States has developed to proportions greatly in advance of any other nation, and our per capita is also greater. Mr. Fritz is personally responsible for some of the wonderful mechanical appliances used to make this result, this dinner and other testimonials being recognitions of the leading part he has borne in the development of a great industry.

THE FOUNDATION OF THE MEDAL.

Referring then to the organization of the Franklin Institute in Philadelphia 86 years ago "for the protection of the mechanic arts," Mr. Birkinbine said that its unexcelled technical library, its lecture courses and its night schools have done much for the advancement of the nation. At the celebration of its seventy-fifth anniversary in 1899, John Fritz presented a paper on the

JOHN FRITZ

1822—August 21, born in Chester County, Pennsylvania.
1838—Apprenticed to the blacksmithing trade.
1846—Employed by the Norristown Iron Works.
1851—September 11, married Ellen Maxwell.
1854-60—Chief engineer and superintendent of the Cambria Iron Works, Johnstown, Pa. During this time Mr. Fritz invented the three high rolls.
1860—Built the Bethlehem Iron Company Works, of which he was general superintendent.
1892—Celebration by iron and steel interests at Bethlehem, Pa., of Mr. Fritz's seventieth birthday.
1893—Made an honorary member of the Iron and Steel Institute.
1894—November 8, awarded the Bessemer gold medal by the Institute, at Sherry's, New York.
1896—Presidential Elector on the Republican ticket.
1902—October 31, mining, civil, electrical and mechanical engineering societies tendered him a banquet at the Waldorf-Astoria, at which they created the John Fritz medal.
1906—June 13, Stevens Institute conferred degree of doctor of mechanics.
1910—November 17, banquet by the Manufacturers' Club of Philadelphia.

Mr. Fritz ran one of the first Baldwin locomotives from Parkesburg to Downington, Pa.

"Development of Iron Manufacture in the Past Seventy-five Years." He then continued:

One of the special features which has been maintained throughout the existence of the Franklin Institute is the encouragement of invention and effort through a Committee on Science and the Arts, which after careful and thorough consideration awards diplomas of merit, or medals where these appear to be justified. The committee on its own initiative, after reviewing the work of John Fritz, has awarded to him the Elliott Cresson gold medal and a diploma—its highest prize—and as past president of the Institute it is my proud privilege to present these to our honored guest.

The Franklin Institute awards the Elliott Cresson Gold Medal under the provisions of the deed of trust from Elliott Cresson of the city of Philadelphia, dated February 18, 1848, on the recommendation of its Committee on Science and the Arts. This medal is to be awarded "either for some discovery in the arts or sciences, or for the invention or improvement of some useful machine, or for some new process or combination of materials in manufactures, or for ingenuity, skill, or perfection in workmanship."

The number of these medals which have been so far awarded is limited, and John Fritz is in very good company as one of the few who have received this recognition. The basis on which the award is made, as set forth in the diploma, is "for distinguished leading and directive work in the advancement of the iron and steel industries." We all agree that the award is well merited, and I am sure that the Franklin Institute medal will be prized by the recipient as a fit companion to the Bessemer medal and the Fritz medal, of which he is the worthy possessor.

Mr. Fritz's Response

President Folwell introduced Col. W. F. Donovan as the toastmaster of the evening, and Colonel Donovan told how as a salesman he once went to Bethlehem to sell Mr. Fritz "something I, young and inexperienced, knew he needed, but he, being experienced, know he didn't." The toastmaster then presented Mr. Fritz, who was given a resounding ovation. Using manuscript, he read that portion of it which made acknowledgement of the honor done him by the participants in the dinner. He then passed the address to Robert W. Hunt, Chicago, who finished the reading. Mr. Fritz said at the outset:

I appreciate fully this kindly manifestation of your esteem. It gives rise to feelings of emotion, which carry me back to my youth when I was working on the farm from daylight until dark, bare footed, as was the custom at that time, driving the cattle into the yard, milking the cows, feeding or working the oxen. In the fall of the year we would stand on the ground where the cattle had lain to warm our feet. The wildest flight of boyhood imagination of that day could not have conceived the grandeur of the ovation which you have given me to-night. I most thoroughly appreciate your kindly greeting and am truly sensible of the great honor you have conferred. It gives rise to sincere joy and takes precedence over all other emotions, and I only regret that I have not the command of language to properly express my sense of gratitude for this manifestation of your respect and good will. I can only say that I thank you from the depth of my heart. But what have I accomplished to render me worthy of this hearty and cordial reception? I am quite sure that what little I have done has been much overrated, and I feel conscious that I am the recipient of honor much beyond that which I deserve. Whatever little I may have accomplished is largely due to the brave and loyal men who so nobly stood by me throughout all the trials and perplexities encountered during my long connection with the iron and steel industries. But, alas, the majority of these loyal associates are gone and the grave has closed over them. Yet they are not forgotten and they shall ever have a green spot in my memory. . . . Much of my success may be attributed to the wonderful progress that has been made in the arts and sciences within this most remarkable century. Having inherited some mechanical ability and being of an investigating turn of mind and disposed to lead rather than to follow, and being possessed of the faculty of drawing able men around me, which is essential at all times to success and more especially at that period, it seemed, in a meaure, that I should blend the old and the new.

FIRST ROLLING MILL EXPERIENCE.

Some of Mr. Fritz's narrative of his earlier experiences has already appeared in print. One extract will suffice to indicate its simple straightforwardness, while it will show the fiber of the young mechanic who made his way into rolling mill work in eastern Pennsylvania. Going to Norristown as a young man, after he had learned the blacksmith's trade, Mr. Fritz met the "general manager" of a new rolling mill then under construction. The youth had never met a "general manager" before, and did not know what the title meant. The general manager was a "large, fine looking man, with a pair of dark, keen looking eyes."

I told him what I wanted. He said they had plenty of men and business was very dull. He then wanted to know if I had been used to hard work. I told him I had and that was what I was looking for. He then asked what I could do. I told him I was a blacksmith and had done some work on a lathe and drill press and could use a hammer and chisel. He told me to come down the next morning. The next morning I was in the mill before 7 o'clock, and I was put to work as a machinist's helper at $1.25 per day, and in a short time my wages were raised to $1.50 per day. Those were regular machinist's wages at that time.

When the mill started I decided that puddling was the most important branch of the iron industry and the hardest work, but I made up my mind to learn it, and my only chance was to learn it at night; consequently, as soon as I got my supper I returned to the mill and worked at night until 10 or 11 o'clock and followed it up until I got a good knowledge of puddling. I also learned much about the construction of puddling and heating furnaces, which was of great value to me in after life. I think no student at college ever worked harder to obtain his diploma than I did to obtain a knowledge of the iron business.

Some of Mr. Fritz's experiences at Johnstown in the fifties and sixties were told in the same engaging style. In conclusion he said:

STEEL IN THE MODERN WORLD.

While we have properly received great credit for unprecedented developments we have made in the iron and steel industry in the United States, we should not forget that it was the inventions of Cort, of Mushet, of Bessemer, of Siemens, and Thomas that enabled us to accomplish such important results, and to them all civilized nations owe a debt of gratitude for the incomparable blessings their inventions have conferred on society. As a result of the inventions of these men the demand for pig iron was so great that the output increased from 286,903 tons in 1840 to 25,795,471 tons in 1909.

Yet, how few of us, even for a moment, think of the trials, troubles, disappointments, mental anxiety and bodily toil these men underwent in the introduction and perfection of their inventions, besides suffering the sneers and jibes of those who imagined that an inventor was nothing but a wild enthusiast, and treated him accordingly. The story of many inventors is truly pathetic—and none more so than that of the lamented Thomas. The personal side of the story of the inventor of the basic process can only be appreciated by the reading of his life.

It is largely to the invention, introduction and perfection of the modern system of steel making in this country that we are indebted for the education of our people in science and in the mechanical and metallurgical arts, which have enabled them to erect such manufacturing plants as were necessary to supply our Government with the sinews of war, making it possible to achieve those glorious victories which at once placed us in the front rank among the nations of the earth.

In conclusion, the modern practice of steel making, in the hands of the mechanical engineer, the metallurgist, chemist and intelligent workman, has produced a material which in quantity, physical qualities and cheapness would have been regarded as utterly impossible some sixty years ago, when steel rails, plates, beams and angles were not thought of and steel was regarded as a luxury.

At this time its cheapness permits its use for the most ordinary purposes as well as for the most expensive machines produced by the skill of the mechanic, and no structure is so grand as to refuse its services. It is the material used in the construction of our vast bridges as well as for the housewife's needle; in the great leviathan that crosses the ocean with the regularity of a railroad train. We find steel asserting its value through every walk of life and extending through every clime, linking hands in bonds which grow broader and stronger with the years, till even now we can see dimly on the horizon the promise of the universal brotherhood of man, the longed-for era of eternal peace.

Address of James M. Swank

Mr. Swank was given a notable reception as he was introduced to speak of his own knowledge of John Fritz's earlier and later successes. He said:

It affords me great pleasure to join with the members

of the Manufacturers' Club and my friends in the iron trade in paying a well-merited tribute to my old friend, John Fritz. My acquaintance with Mr. Fritz began 55 years ago in 1855, when he came to Johnstown as the general superintendent of the Cambria Iron Works, which had been leased on May 15 of that year for a term of seven years by the firm of Wood, Morrell & Co. These works had been built in 1853 and 1854 by the Cambria Iron Company as an iron rail mill, with several blast furnaces. They made their first rail on July 27, 1854. Only iron rails were made in this country for several years afterward.

SUCCESS AND TRIALS AT JOHNSTOWN.

A great problem confronted Mr. Fritz. He had to so manage the works as to make them a financial as well as a mechanical success. He succeeded in both undertakings. In 1856, the year following his assumption of this difficult task, the Cambria Iron Works rolled 13,206 tons of rails, and their annual production was thereafter increased under Mr. Fritz's management. The production in 1856 was only 5386 tons less than the largest production of any rail mill in the country in that year—the mill of the Phœnix Iron Company rolling 18,592 tons.

When Mr. Fritz took charge of the Cambria Iron Works he soon discovered that good rails could not be made from pig iron that had been made entirely from Cambria ores; so, after much tribulation, he introduced a mixture of Cambria and other pig iron, which worked well.

But Mr. Fritz was not satisfied with the results he was accomplishing. The Cambria rail mill was equipped with two-high rolls, and as these could not be operated as economically as was desirable, and besides often invited accidents, Mr. Fritz conceived the idea of introducing three-high rolls, which had never before been used in any country in the manufacture of rails. This was done, and in July, 1857, the innovation proved to be a great success. Mr. Fritz had conspicuously shown his skill as an engineer. Soon there were three-high trains in all the rail mills of the country.

But a great trial came to Mr. Fritz the day after his successful use of three-high rolls. On that day the Cambria Iron Works burned down. We well remember that catastrophe. All but the stoutest hearts were appalled. Mr. Fritz was equal to the emergency. He infused courage into the breasts of all his men and at once began the work of clearing away the débris and rebuilding the works. In precisely four weeks the new works were running, and they made 30,000 tons of rails before any interruption occurred from any cause whatever.

Mr. Fritz was surrounded at Johnstown by a remarkably bright collection of engineers and mechanics, all young men, who gave him loyal support, but who also learned much from him. They were long known as John Fritz's "boys." We can mention only a few of them: Jacob M. Campbell, Alexander Hamilton, George Fritz, William R. Jones, Daniel N. Jones, William Canam, James Bell, Thomas H. Lapsley, and Benjamin Watkins. Robert W. Hunt, the first chemist of the Cambria Iron Works, came just as Mr. Fritz left Johnstown for Bethlehem. Captain Hunt is with us to-night.

BETHLEHEM CAREER AND LATER HONORS.

Mr. Fritz's connection with the Cambria Iron Works continued until July, 1860, when he resigned to superintend the erection and operation of the Bethlehem Iron Works, to embrace an iron rolling mill and a number of blast furnaces. The rolling mill was successfully started in 1863. In 1873 Mr. Fritz introduced at these works the manufacture of Bessemer steel and Bessemer steel rails, and in 1890 he made for the Navy Department at the works of the Bethlehem Steel Company the first heavy armor plate that had ever been made in this country. The armor plate plant of this company had been built under Mr. Fritz's direction.

A few years ago Mr. Fritz retired from all active participation in the management of iron and steel works, after more than fifty years of unbroken success, which has brought him many honors. Included in these honors we may mention honorary membership in the British Iron and Steel Institute, which has conferred upon Mr. Fritz the Bessemer gold medal. We may also mention a magnificent banquet which was tendered to Mr. Fritz by a large number of prominent engineers and iron and steel manufacturers at the Waldorf-Astoria in New York in October, 1902, in celebration of his 80th birthday anniversary.

But we feel sure that no honor that has ever come to Mr. Fritz has afforded him more heart-felt pleasure than the testimonial which he received at Johnstown on July 4, 1860, immediately prior to his departure for his new field of labor at Bethlehem. On that day a superb set of silverware was presented to Mr. Fritz at the rolling mill of the Cambria Iron Works by the employees of Wood, Morrell & Co. Between 1500 and 2000 persons were present at the presentation, including many ladies. Their presence testified of itself to the esteem in which Mr. Fritz was held by the whole community. The set of silverware included a remarkably handsome water pitcher. On it were inscribed these words: "To John Fritz, Esq., General Superintendent of the Cambria Iron Works, as a Testimonial, by the Employees. July 4, 1860." This pitcher was exhibited at the New York Crystal Palace during the World's Fair in 1853, and it took the first premium as the finest piece of silverware among many specimens that had been collected from all parts of the world. Several addresses were delivered, Col. Jacob M. Campbell presenting the tea set in behalf of the donors and Mr. Fritz thanking them, as the Johnstown *Tribune* said, "in a very feeling, frank, and earnest speech." Mr. Fritz was then 38 years old. He had been general superintendent of the Cambria Iron Works for five years. He was succeeded by his brother, George Fritz.

The *Tribune* devoted much space to an account of the testimonial to Mr. Fritz, remarking at the close of the account that "the gift is but properly in keeping with the measure of the man," and that "in Mr. Fritz the company and this community lose a man and citizen whose place is not easily filled." Mr. and Mrs. Fritz were among the best people who ever lived in Johnstown.

We are all glad to see Mr. Fritz looking so well to-night. He has hosts of absent friends who would share this pleasure if they were here. I know of no man in the iron trade who has been so universally respected and loved as John Fritz. His personal qualities have been as lovable as his engineering achievements have been notable. From first to last, from the beginning of his career to the present time, he has beautifully illustrated Shakespeare's wonderful characterization:

> "A combination and a form indeed,
> Where every god did seem to set his seal,
> To give the world assurance of a man."

Response of Charles M. Schwab

President Schwab of the Bethlehem Steel Company said that it was not the John Fritz of Johnstown in the old days nor the John Fritz of later years in charge at Bethlehem of whom he would speak, but the John Fritz of to-day in the community in which he lives. While Mr. Fritz might be proud of the medal just presented to him and the other medals bestowed at various times in his career, his greatest medal and the one that would live for all time is that which he has impressed upon the hearts of all who know him. He told of the trouble Mr. Fritz had stored up for him, for in all the proposals the speaker had brought forward at the Bethlehem works, no matter how fortified, the clinching argument of any one who differed with him was that "Uncle John wouldn't have done it that way." The buildings Mr. Fritz left at Bethlehem are models of construction. Only the other day a remark was passed at South Bethlehem that the old converter building was the best in all the plant. Mr. Schwab paid a tribute to Mr. Fritz that was eloquent in its spontaneity, saying in conclusion that John Fritz will be known longer than any steel works that was ever built, and deserves to be.

Honor from Temple University

Rev. Russell H. Conwell, D.D., president of Temple University, Philadelphia, eulogized Mr. Fritz in terms that evoked the most enthusiastic response from his auditors. He made the pleasing announcement that the trustees of Temple University had conferred upon Mr. Fritz the degree of Doctor of Science. Hampton L. Carson, ex-Attorney General of Pennsylvania, followed in an address which was pitched on a high plane, referring to the guest of the evening as the representative of a class that is the bone and sinew of the community. He dwelt upon the importance of the John Fritz type of citizenship in a time when there is such a demand for manhood in public life. Capt. Robert W. Hunt was also called upon and spoke entertainingly as "one of John Fritz's boys," concerning the experiences of early Bessemer days.

Response of Joseph E. Thropp

The well-known Pennsylvania ironmaster, Joseph E. Thropp, made the concluding address of the evening. He said, among other things:

You have seen the trade develop from the little cold blast driven furnace making 30 to 50 tons per week until to-day our mighty furnaces can produce 36,000,000 tons per annum, and this favored land of ours leads the world. Just think—nearly half a ton of iron per annum for every man, woman and child in the United States! You have seen

us produce and lay in our country railroad iron which if welded together would make a band long enough to put hoops 30 times around the world. God created the billions upon billions of tons of limestone, coal and iron ores seemingly without value. When in considering them for development, what is required to make a ton of iron is worth only about 70 cents royalty in the ground. We take these raw materials and drive our drills, picks, and shovels into them, assemble them over our railroads. By analysis we determine their exact composition and then extract the iron, the first step, and start it on its further development by which we help these boastful but dependent cotton and woolen captains of industry to till the land to raise and pick their cotton, to raise the crops to feed their flocks, and further to clip, gather, card, spin, and weave their products with our iron-made implements. We make the cars and engines for the palatial trains in which they ride and the rails upon which the trade of the world is largely carried.

They may take a piece of iron ore and throw it into the water and say it sinks; but you, Mr. Fritz, have helped show them how we extract the iron from such ores and fashion it, step by step, until we rivet the great plates into a mighty vessel 104 ft. high, 882 ft. long and weighing thousands of tons. We let it glide out upon the water and, supplied with every equipment and luxury, we carry in it 5000 passengers in a single trip from shore to shore across the ocean in five days. We fashion the mighty engines of war which help shape the destiny of nations, and we make the delicate instruments which are used in treating the wounds of "the men behind the guns." Or we turn our skill in other directions and develop the fine main and hairsprings of the watches and we again help these and other dependents to time their hours of work and to move trains; we help the scientists to estimate the speed of the moving planets through the heavens, or the doctors to count the pulse beats of the human heart.

Let us consider right here the degree of efficiency and skill which has been reached in a single direction. A fine hairspring of the finest watch weighs 1-125,000 pound Troy, and when we calculate its value and remember that but one of ten can possibly be used and how many it would require to make a gross ton, we find that the 70 cents value hidden in the ground would be worth in the finest watches thirty-five billions of dollars. Should we not all, then, take off our hats to John Fritz, who has been one of the leaders in a business we rightly call the King's business? His life has been an inspiration to me and doubtless to hundreds of others. Well do I remember when I was employed as assistant superintendent at what was then thought a large furnace at Conshohocken. Right soon I heard of what John Fritz was doing at Bethlehem and was told he had been an engine driver at a little furnace at Spring Mill. I felt that "what man has done man can do," or at least make a try at it. Ever since then I have had in mind men like John Fritz and Mr. Patterson of Hughes & Patterson, both of whom started as blacksmiths not many miles from where we sit.

You, sir, our honored guest, have left "footprints in the sands of time" that others "seeing may take heart again." Following in the footsteps of Him who worked as a carpenter at the bench you have helped dignify labor. We hope we add to your happiness by this banquet. We cannot add to your honors. We honor ourselves by honoring you.

Participants in the Dinner

J. Arthur Adamson, L. A. Amonson, Joseph W. Adams, A. C. Buzby, J. Clifton Buck, Louis Burk, Robert Balfour, James C. Brooks, Elmer E. Brown, Calvin T. Beers, Edward H. Burr, James B. Bonner, Joseph G. Butler, Jr., Robert E. Brooks, Robert W. Bailey, Horace Boyd, J. Max Bernard, John Birkinbine, Alfred E. Burk, Albert Broadhead, Cyrus Borgner, L. D. Berger, John W. Brown, Robert B. Beahm.

Hampton L. Carson, T. I. Crane, John J. Caine, Charles N. Cressman, Edgar S. Cook, Isaac H. Clothier, Edward Bailey Cook, Joel Cook, Horace W. Castor, S. A. Carson, George M. Costello, George A. Chandler, Walter Clark, Rev. Russell H. Conwell, D.D., T. W. Coleman.

A. J. Dull, W. F. Donovan, Charles M. Dodson, George C. Davies, George W. E. Doster, Ernest A. De Bergh, George D. Dobbins, Henry S. Drinker.

Cyrus Elder, George A. Elsasser, J. E. Elverson, J. G. Eberlein, Thomas M. Eynon, H. S. Evans.

John Fisler, William H. Folwell, N. T. Folwell, J. W. Fuller, Jr., B. F. Fackenthal, Jr., A. E. Fletcher, E. F. Freeman, A. I. Findley.

E. G. Grace, J. B. Gibbs, O. J. S. Gaige, M. R. Gano, James Gayley, Alex. C. Graham.

Richard Hirst, J. D. F. Hendrickson, Dr. Henry D. Heller, Charles R. Hall, William T. Hunter, Clement R. Hoopes, Charles T. Hess, H. D. Hughes, Robert W. Hunt, W. P. Hopkins, Hugh M. Irvin.

J. W. Jewett, Archibald Johnston, Lester B. Johnson, Joseph D. Kelly, Howard Knecht, Julius Keller, Samuel R. Kirkpatrick, Thomas J. Koch, Charles F. Kolb, Jr., Hugh Kennedy, Dr. Wilmer Krusen.

Joseph T. Leiter, Wm. H. Llewellyn, C. G. A. Loder, O. C. Lippincott, Horace A. Luckenbach, J. Bertram Lippincott, H. J. Laciar.

August A. Miller, Michael Murphy, A. E. Maltby, George D. McCreary, Benjamin Miller, J. Jacob Mohr, A. Markle, W. Park Moore, Charles E. Morris, Hugh McCaffery, Charles A. Matchum A. D. Mixsell, Aaron P. Miller, J. King McLanahan, Eugene J. McAleer, O. H. Meckley, W. B. Myers, De Coursey May, H. S. Martin, J. King McLanahan, Jr., Henry W. Moore, James W. Nagle.

George Ormrod, John D. Ormrod, Col. C. T. O'Neill, G. A. Pfeiffer, Leonard Peckitt, Lincoln K. Passmore, Michael G. Price, W. G. Pursel, H. B. Price, William J. Pedrick, Jr., Thomas J. Price, Harold Pelree, M. P. Quinn.

Frederick A. Riehle, J. W. Rawle, James P. Roe, W. B. Robinson, F. C. Roberts, Samuel Ruby, David Reeves.

Charles D. Schoen, James M. Swank, F. C. Smink, Charles M. Schwab, James F. Sullivan, Abraham S. Schropp, A. J. Sanders, Powell Stackhouse, H. S. Snyder, W. T. Smith, C. J. Stark, Mitchell Stead, Robert S. Sahlin.

Harry E. Trexler, Joseph E. Thropp, Benjamin Talbot, William R. Tucker, William L. Todd, David Townsend, Edwin Thomas, C. von Philp.

Warren Webster, Edward R. Wood, John S. Wentz, W. A. Wilbur, S. B. Wetherill, Howard Weiss, Eldredge P. Wilbur, Robert E. Wilbur, Elmer P. Weisel, W. P. Worth, N. P. Wittman, Francis Whitaker, C. C. Wanamaker.

The Joseph Joseph & Bros. Company's New Scrap Yard at Lebanon, Pa.—The Joseph Joseph & Bros. Company has leased a tract of 18 acres at Lebanon, Pa., for the establishment of a scrap iron yard, which is to be the largest of its kind in the country. The work of putting the yard in shape for business will commence at once. It is understood that the Reading Railway Company has the contract to build 2½ miles of track on the property. Contracts for necessary buildings will soon be awarded, including several very large storing sheds. The company has purchased one locomotive for use in Lebanon, and arrangements for a second are under way. The company has large yards at various points in the country, including Cincinnati, Chicago, St. Louis and Worcester, Mass., but has hitherto had none in eastern Pennsylvania. Lebanon was chosen as the site for the new yard because of its good shipping facilities and also because of the heavy local demand for scrap. Mayo Fechheimer, formerly connected with the New York office of the company, has been appointed to manage the Lebanon branch.

Steel Production in France in 1910.—The production of steel in France in the first half of 1910 amounted to 1,632,000 tons, against 1,506,329 tons in the first half of 1909 and 1,364,979 tons in the first half of 1908. The distribution by processes is as follows in metric tons:

	First half 1909.	First half 1910.
Bessemer, acid	46,149	41,707
Bessemer, basic	909,995	1,033,367
Open hearth	541,598	542,774
Crucible	7,973	8,143
Electric	620	6,511
Totals	1,506,329	1,632,000

The production of finished steel as classified was 1,106,919 tons in the first half of this year. The principal items are 156,828 tons of rails, 111,490 tons of beams, 458,759 tons of merchant bars and shapes and 192,155 tons of plates and sheets.

The Cambria Steel Company's Improvements.—The Cambria Steel Company, Johnstown, Pa., is trying out its new 8-in. Morgan continuous merchant mill. It has a capacity of about 6000 tons a month and rolls rounds and squares from ¼ to ¾ in., and flats from ⅜ to 1¼ in. in width and from ⅛ to ½ in. in thickness. The new mill will add materially to the capacity of the bar department and will enable the company to take care of its constantly increasing business in this line. A 12-in. Morgan semicontinuous merchant mill is also under construction and will be ready for operation about February 1. The new rod mill will be completed about March 1 and the wire mill will be started a few months later.

The Hudson River Ore & Iron Company's property at Burden, Columbia County, N. Y., was sold under foreclosure of mortgage November 10. It was bought in by representatives of the bondholders. The portable property, comprising mine supplies of all kinds—locomotives, cars, rails, bridge material, wrought pipe, tool steel, &c.—will be disposed of at private sale by the new owners.

Contracts for Iron and Steel Products

Manufacturers' Views on Methods of Making Them More Than Options on Material

One of the important matters considered at the New York meeting of the American Iron and Steel Institute October 14 was the long prevailing laxity in respect to contracts for iron and steel products and the steps which should be taken by co-operative effort to make contracts binding. The subject was opened up in a paper by Willis King, vice-president of the Jones & Laughlin Steel Company under the title, "Contract Obligations." It was given in *The Iron Age* of October 27, page 970. The discussion of Mr. King's paper was participated in by Charles M. Schwab, president of the Bethlehem Steel Company; John A. Topping, president of the Republic Iron & Steel Company; Charles S. Price, president of the Cambria Steel Company; H. P. Bope, vice-president of the Carnegie Steel Company; J. A. Farrell, president of the United States Steel Products Company, and E. J. Buffington, president of the Illinois Steel Company. From the report of the discussion, as just published by the Institute, we take the following:

Charles M. Schwab

It seems to me that this paper so ably presented by Mr. King admits of no discussion. The facts and premises as set forth are so evident to all that what it needs is our approval and our co-operation rather than a discussion of the subject. It was my pleasure at a meeting of this Institute last winter to state that I had seen men in this industry honored for scientific attainments, for reduction of production costs and for other achievements, but that was the first time I had seen a man honored, as Judge Gary had been honored, for the introduction of a new principle of such advantage to our business. It does seem to me that if the principles and foundation of this Institute are carried out, as we have planned to carry them out, and as the gentlemen here have so ably seconded, this matter of business contracts must necessarily follow. I do not believe that there will be much necessity for contracts, especially what we call "requirement contracts" when purchasers know at all times that they are going to be fairly treated and will receive their supplies at fair prices. The contracts that have been made in the past, and I have had my fair share of making them, were those which could fill every requirement. Those contracts allowed people to take any tonnage they desired when the price was good and none if the price was not favorable. That I think is not fair. We do not want to carry this out in any way other than in the broadest spirit. The ablest lawyers with whom I have consulted in the drawing of contracts have never in my experience been able to draw a contract sufficiently tight to prevent some clever man from evading it, and I believe we should carry these matters out in the broad spirit which Mr. King has outlined.

John A. Topping

I agree with Mr. King in his general premise that the world is making progress toward better things, which I believe is due to the more progressive spirit of the times and to broader and more tolerant views now entertained by our leading men. I also believe that the business world is in step with this spirit of progress. In the iron and steel trades, our greatest advance, perhaps, has been in the direction of mechanical inventions and new processes, and while we have made some progress commercially, in our general methods of doing business, yet abuses have crept in and have been allowed to continue, because our attention has been too much absorbed in other directions.

The greatest progress which we have made commercially, in my opinion, has been in the direction of co-operation, as advocated by Judge Gary, which has resulted in establishing the iron and steel business on a more substantial basis, so that I believe we now have a foundation upon which we can safely build for the future and work out in concert whatever reforms or improvements may seem necessary and advisable from a mutual benefit point of view.

I quite agree with Mr. King that much has been accomplished in the way of a general uplift movement, by greater attention to sociological questions, in an effort to raise the standard of living and intelligence of our labor. Profit sharing is also now much in vogue and a better understanding as a whole exists between capital and labor in the iron and steel trade than ever before. In saying this, I do not mean to suggest that we have reached an ideal state in any direction; in fact, it is my opinion, that there is much room for further progress in all directions, both in methods and economies, and also in broadening and defining the plan of co-operative work, so far as co-operation can be admitted within the spirit of the law.

I agree with Mr. King in the proposition that no greater abuse exists than the indifference of both buyer and seller to the maintenance of contract obligations. I can well remember, in my own early business experience, that a violation of a contract was then considered a matter of such business dishonor, that no self-respecting business man would contemplate repudiating his agreements, regardless of conditions, any more than he would repudiate the obligation of a note or commit a dishonest act.

CAUSES OF PRESENT CONTRACT ABUSES.

Mr. King has given you some of the reasons which have brought about the present situation, but in my opinion the principal reason for the present abuse of contract obligations, is due to the practice of price guarantees, options and sales allotments established during the early period of the so-called trust formation. Being then associated in the management of one of the companies merged, I quite well remember that the arguments advanced by associated managers of sales to justify guarantees under contracts and other privileges mentioned, were that as production at the period mentioned in most lines of iron and steel represented approximated 80 to 90 per cent. of the total output of the United States, there was some equity in the claim made by merchants and the general consumers of iron and steel that entitled them to protection against shrinkage, in view of the fact that natural laws regulating values were not operative. To stimulate confidence and to overcome the fear entertained by many buyers of iron and steel, and to stimulate warehouse stocks on a price basis somewhat artificial, guarantees were resorted to; in time, the practice thus established became a fixed policy. As competition developed and independent operators came into the field, they were also compelled to give their customers the same protection as was being extended by the larger companies, who were substantially in control of production. The reasons which then obtained, however, no longer exist, as the markets to-day are not under the control of any one company and iron and steel values are now more nearly influenced by the natural law of supply and demand; and I believe that buyers of intelligence should not be penalized by placing them on a parity with their less intelligent competitors who depend upon the paternalism of the seller rather than upon intelligence of management for their business success.

BUYERS WOULD WELCOME CONTRACT REFORM.

I have talked with a number of important buyers of iron and steel, and while I do not pretend to say what would be the general consensus of opinion on the part of all buyers or consumers of iron and steel, it is my opinion, from interviews I have had, that a reform in the matter of contract guarantees would be very generally welcomed, it being freely admitted that no objection could be raised to the enforcement of contracts, provided the rule was generally observed, and that no hardship would result, as merchants would then have proper moral support for the enforcement of their contracts against their customers and also against the seller. From the seller's point of view there is no valid reason justifying the continuation of present practice, except for reasons of expediency, as Mr. King suggests, and from the buyer's point of view, no objection could be raised if no exceptions are made to the enforcement of contracts. Therefore, why not make a concerted effort to apply the same general spirit of reform to our business methods that public sentiment demands in matters political and otherwise, by considering at once ways and means to effect a change.

What Lord Palmerston said, relative to reforms in the British War Office, in 1811, is entirely apropos of this business subject: "There was a time when it was not the fashion for public men to say, 'Show me an approved abuse, and I will do my best to correct it.' Times are changed. Men now say, 'Show me a practical improvement, and that improvement I will do my best to realize.'" On account of the timidity of the smaller operator, a reform of the kind discussed cannot be made successfully effective unless we have the moral influence of a leader who is big enough to put it into effect and sufficiently resourceful to defend it. Fortunately for us, we have such a leader and one power-

ful enough as a trade factor, broad enough and sufficiently discreet to show us the way. I refer to Judge Gary; and of him I think you will all agree with me that the sentiment expressed by Bulwer reflects our sentiment: "In families well ordered, there is always one firm, sweet temper, which controls without seeking to dictate. The Greeks represented persuasion as crowned."

Should the United States Steel Corporation decide to adopt for its policy the enforcement of contract obligations, I believe that uniformity of practice would speedily follow by concerted action on the part of other leading producers adopting a similar individual policy for the enforcement of contract obligations. So far as my own company is concerned, we are not big enough to enforce the policy single handed, but we would be glad to follow the leader I designate, provided other leading interests follow.

Charles S. Price

As Mr. King states in his paper there has developed in the steel industry in recent years "a laxity or indifference to the moral obligations of a contract" which "does not seem to have obtained a foothold in any other manufacturing or commercial line." Mr. King has endeavored to put himself in the place of the buyer and has advanced the only justification possible in the circumstances, but he immediately points out that the so-called items of justification are no justification whatever.

Concisely, the evil, for so it is best called, in our present sales system is that contracts are made covering tonnages for more or less long periods, to be specified against by the buyer practically as he needs. On a falling market he does not specify, or actually cancels. The so-called contract has, therefore, become an "option."

WHY CONTRACT BREAKING IS TOLERATED.

Why? Because of competition and fear—anxiety under keen competition to get business, even under this now customary contract, and fear to hold the buyer to his contract because he would be lost forever as a customer so long as he finds the other makers ready to give him these options.

Both from a moral and a legal standpoint, the cancellation or attempted cancellation by the buyer of a contract for the purchase of material is wholly unwarranted, unless the seller has done some act which justifies it. It is a vicious practice from every point of view, and it is vitally necessary for the manufacturers to enforce all obligations of the character covered by these sales contracts; otherwise, any general recognition of the right of purchasers to cancel orders in whole or in part might any time grow into a trade custom, to which we are now dangerously close, and make it difficult to enforce contracts of this character.

The practice of booking tonnage far in excess of the possible capacity of either the seller or buyer to handle within the period of the contract, has much to do with the instability of the contract. Assuming a valid contract with all the elements of mutuality, the proposition that one party to it can cancel it in the absence of any act of the other to justify the same, need only be stated to be denied. It is indeed something about which there can be no argument. Under the existing treatment of these contracts, all of the burden is borne by the seller (the contracts for materials entering into his manufacture are rigidly lived up to), and all benefits are reaped by the buyer because he can, and does, repudiate any contract that proves unsatisfactory to him.

SUGGESTED REMEDIES.

As to the correction of this contract-option practice, I would make the following suggestions:

There are two general classes of buyers of steel—the merchant and the consumer. The problem of making a satisfactory contract with the merchant is a simple one. It should be a contract for a short term: say, not to exceed ninety days, and including a clause providing that specification shall be furnished in only equal monthly quantities, and that any unspecified monthly quota may be cancelled at the option of the seller without notice to the buyer. The merchant, if he wishes to speculate, should do so with his own capital. It is his business to keep in close touch with the trade, and if in his opinion prices have touched bottom he should have the courage of his convictions to replenish his stock by outright purchase, furnishing the steel maker with immediate specifications.

In general, a period of six months should be ample time for a contract with consumers of steel. By inserting the monthly specification clause the seller can protect himself against the common practice of the buyer holding back specifications on a falling market and then dumping a load of orders on the seller at the last moment just as the market is advancing.

There is a class of buyers who claim that the nature of their business requires a yearly contract. If this claim can be substantiated and if, as is claimed by them, a great decline in the price of steel would necessitate a similar decline in the price of their product, a clause calling for adjustment of prices every three months would appear to be fair to both parties. By giving the buyer the privilege of naming a maximum and a minimum tonnage, the maximum not to exceed the minimum by more than 25 per cent., the seller has good grounds for enforcing the sending in of specifications.

With some such features as herein suggested, there is no reason why the contract should not be equally binding on both parties. Individual effort to bring about a reform in this matter of contract obligations will be futile. It must be through the co-operation of the steel industry as a whole, and unquestionably there can be no better medium to effect this than the American Iron and Steel Institute. To this end, my recommendation would be that the president of this body should appoint a special committee to draft standard forms of contract which could be universally adopted by the industry, submitting them for action and approval by the Institute at as early a date as possible.

H. P. Bope

It is not sufficient for us to recognize that an evil exists; it is necessary to find a remedy for that evil. All that we have heard to-day from the speakers who have preceded me has been from the standpoint of the manufacturer. You have been asked to believe that he is the only party who has suffered, and that the poor customer has no rights which the manufacturer is bound to respect. Now, there is something to be said on the other side. What shall we say of instructions in congested periods of business to "sell and repent"? Unquestionably all of us have done that more or less, resulting in obligations assumed by the manufacturers as to delivery, which obligations the buyers not only acceded to but would have been willing to meet had those obligations been lived up to by the manufacturers, and would have made such contracts as binding and honorably fulfilled as any other obligations in commercial life.

TWO KINDS OF CONTRACTS.

In order that we may have clearly before us the groundwork upon which we must decide the question, there are two general forms of contracts; first, the specific; second, the blanket. And while these two may be further divided, for general purposes these classifications will answer. A specific contract is one where the buyer contracts for a specific piece of work, or for the materials required in such work. He obtains his own price in making his contract with the purchaser and when he places his order for the materials required he is morally bound to pay the price at which he agrees to take them because he suffers no loss, having based his purchase upon his own contract price for the particular piece of work. It may be admitted that there is a certain amount of moral obliquity in all of us, and, of course, the buyer is no more exempt than the seller. We have had concerns of high commercial standing come to us, after they had agreed to pay a specific price, and a reduction had occurred in the market during the life of the obligation, to have the price reduced, but we have almost invariably refused such requests.

Then there is the blanket contract, which in the past, as you have heard, has placed no obligation upon anybody. When the market was high the seller tried to sell all he could, regardless of future conditions, and when the market was low the buyer tried to buy all he could possibly obtain. In neither case was there any obligation, specific or implied, on the part of either party to the transaction that the terms of the obligation would be lived up to in full, and our contracts under such conditions naturally became mere options. It has created the abuse which has crept into the steel business, although, in addition to the causes recited by Mr. King, certain other facts have helped along the situation: First, the tremendous growth in the steel business in this country, which Judge Gary so strikingly illustrated in his opening remarks; second, the fact that the mills in this country are widely scattered. Conditions differ in different localities, and in their natural desire to retain the home trade, mills meet conditions which they find near at hand. In addition there has been, until comparatively recently, great fluctuations both in price and demand. So it is not surprising that we are to-day confronted by conditions not known elsewhere; and recognising that these conditions are detrimental to the interests we serve, we must now hunt for a remedy.

SHORT TIME CONTRACTS THE SOLUTION.

Mr. Price has made a suggestion which seems to me to open the way; only, in my judgment, he does not go far enough. My opinion is that the solution of this problem is in the short time contract. I do not believe it is necessary to-day, if indeed it ever was, to protect buyers in requirement contracts over a long period of time. We know from experience that buyers will not take out what they have purchased if there is a reduction in price resulting from a diminution in demand. I believe a ninety-day contract in all cases is amply sufficient to protect the buyer and seller. It gives each equal rights, and if there is a turn within that period each is equally protected. If prices advance the seller is given an opportunity within a

reasonable period to take advantage of such advance; if prices decline the buyer is not compelled to suffer any considerable loss over a long period of time. Such contracts, of course, must carry the provision that the buyer must not be permitted to buy any more than he can reasonably consume in the given period, and on the other hand the seller is not to sell more than he can reasonably deliver in that same period. By the methods of business employed today most manufacturers know within a reasonable amount what a given buyer can consume in a given period, and with this data at command the obligation of buyer and seller to deliver and take can certainly be reasonably met. As a salesman I know how difficult it is to restrain one's natural inclination to reach out and take business, and undoubtedly we have not always been as careful of the rights of our neighbors as we should have been; but if we are to believe Mr. King's statement that the world is growing better, that we are on a high moral plane of business, which I hope and believe to be true, then buyers, recognizing the moral as well as the legal obligation of a contract, will be just as anxious to meet us under proper conditions as we are to secure their business.

NO GUARANTEE AGAINST DECLINE.

Then I would absolutely refuse to give any guarantee against decline. I believe it to be a vicious practice, and it should never have been grafted on the steel business. It puts an obligation upon the seller only, and no contract is equitable which has not the mutual feature of advantage to both contracting parties.

Assuming that we have reached the point of the short time contract, of which there can be no legal question as to form, "the outward and visible sign" having never been questioned, we have made a long step in advance. Our trouble has been that the "inward and spiritual grace" on the part of both the buyer and seller has been lacking, because, to restate the situation, the tendency in recent years has been in periods of high prices for the seller to sell all that he can possibly put upon his books, with little or no consideration as to how such material is to be delivered—and often delivered at higher prices to the exclusion of tonnage taken at a lower figure—which makes a practice as vicious on the part of the seller as for the buyer to endeavor to obtain at a low price more than he knows he can possibly use, with no real intention of ever taking out such tonnage if conditions go against him. We do not like to say these things to our brethren from across the sea, yet we must admit that such conditions do exist. And while the causes have been so compelling that they may be condoned, they cannot be excused.

We are here to-day to find, if possible, a remedy, and as a summary of what I have tried to put before you I would suggest: First, short time contracts; second, no guarantee against decline; third, by such contracts to prevent the buyer from buying more than he requires for use in the given period; fourth, an equal obligation put upon the seller not to sell more than he can deliver within the term period. If we can put such a basis of contracting into use—and I am sure that it is possible from the experience of the Carnegie Steel Company last year, when we reached in many cases the perfection in this method of contracting—then Mr. King's millenium will have arrived.

James A. Farrell

I quite agree with Mr. King that the habit, on the part of buyers of steel products, of regarding a contract for future delivery as not morally binding on them if the market or circumstances are not favorable to their taking delivery when the time arrives, is not evidence of any moral laxity on the part of the buyers. It is a trade custom which has been allowed to develop, and for which the manufacturers are themselves chiefly, if not wholly, responsible. It has grown, partly from the very natural desire of manufacturers to provide for the continuous operation of their mills, partly from the equally natural desire of middlemen and large consumers to cover their possible future requirements to best advantage, but chiefly from the overweening desire of salesmen to do all of the business in their territory. This, of course, is a manifest impossibility, but that has not deterred salesmen from trying to do it.

For the purpose of making a good showing in the volume of sales and contracts, buyers, and particularly the large wholesale merchants, have not infrequently been induced, not to say inveigled, into placing contracts covering as extended a period as possible, for tonnages which they may hope to sell, and in some instances which they can have no reasonable expectation of being able to sell. The same procedure is repeated with their competitors, and it is often repeated with the same buyers by salesmen representing a number of competing manufacturers. Consequently if the order books of all the manufacturers could be compared it would frequently be found that the aggregate contracts with buyers in a given territory far exceeded the maximum possible consumption under the most favorable circumstances. To carry out all these contracts would mean the flooding of the market with an immense unsalable tonnage which could only be worked off during an extended period which, to the manufacturers, would necessarily be one of extreme depression, low prices and closed plants. To the merchants it would mean, in many cases, bankruptcy pure and simple. It is perhaps fortunate that since the organization of the American Iron and Steel Institute the practice has, to a large extent, decreased.

CONTRACTS BETTER REGARDED ABROAD.

In dealings with other countries similar practices are not encouraged. With most of our friends abroad contracts are contracts, to be carried out whether the market goes up or down, and consequently, buyers have learned to look before they leap and generally do not purchase more than they can reasonably expect to be able to take. There is, however, a practice not as prevalent now as in the past in some lines of the steel industry, of making sales subject to what is known as the "fall" clause, which obligates the seller to reduce the contract price if the market falls during the life of the contract. This clause is sometimes limited to what is known in this country as "guaranteeing the buyer against the seller's own decline," but in other cases the contract provides that the buyer will not have to pay more than the market prices ruling at the time deliveries are made.

To my mind, the objectionable practice of entering contracts which are not binding contracts can be very considerably restricted, if manufacturers generally will only take effective steps to discourage the booking of such contracts by their salesmen. So long as a salesman's prospects of advancement are dependent wholly, or principally, upon the volume of his sales, so long will he be tempted to place tonnage ahead of all other considerations. Of all the influences tending to promote excessive and unnecessary competition, resulting in unremunerative prices, and unsatisfactory conditions generally, the agent on commission is probably the greatest.

In any commodity where business is principally conducted through commission agents, prices are usually lowest and conditions most unsatisfactory. The agent, depending for his remuneration on the volume of his sales, becomes, perhaps unconsciously and unintentionally, the buying agent of the buyers, rather than the selling agent of the manufacturer, and his chief endeavors are devoted to inducing the manufacturer to constantly reduce prices to the level necessary to undersell every other manufacturer. If, on the other hand, a salesman's remuneration and chances of advancement depended, not upon the volume of his sales and contracts, but upon the *profits* derived from the goods actually delivered to the buyers, he would be just as anxious as the manufacturer to secure the best possible prices, and would not waste his energies and time in securing contracts which might and probably would be mere waste paper.

E. J. Buffington

The subject of contract obligations has been so ably presented and so ably discussed that it leaves very little to say on the subject. I am glad that the responsibility of manufacturers for existing conditions in these respects has been recognized. I believe that the cause of any laxity—I will not say in business ethics—in business methods in respect of contract obligations is due altogether to the manner in which manufacturers conduct their sales. And the cure of any evil tendencies that have been spoken of this afternoon in discussing contract obligations rests entirely within the command of the sellers, the manufacturers. I have become so imbued with the idea of the benefits of co-operation that I look to it as a panacea for all ills and ailments that we may find in our business. Co-operation seems to be the logical way of doing those things which we desire to have done. We recognize its efficiency in school work and in college work. We recognize its usefulness in departments of manufacture and there term it "team work." We have seen the good that comes from co-operation, and manufacturers should avail themselves of the opportunity to co-operate in all proper ways for the regulation of all business methods and for correcting any business tendencies.

The troubles which arise through lapses in contract obligations are not difficult to correct if we apply the remedies which are within our reach. The selling of merchandise is represented by a contract, resulting in mutual obligations. These obligations should be recognized and lived up to by both parties to the contract. These obligations are legally binding.

Mr. Hope has referred to one obligation assumed by manufacturers in selling their products, which at times some of us are not as regardful of as we should be—the obligation of making deliveries to the buyer. In seeking to correct any tendency toward laxity in contract obligations, let us remember to start right and keep our record clear from any charge of laxity in recognition of our obligations.

Motor Trucks and Delivery Wagons

The Various Industrial Types Used and Special Features of Their Construction

BY H. W. PERRY.

Self-propelled vehicles are coming into extensive use in American cities and suburban places for a great variety of industrial purposes. The awakening of interest in commercial motor vehicles has been widespread during the last four or five years, and the future progress and development of the motor car industry is said to lie largely in this direction. A number of leading pleasure car manufacturers have already embarked in the production and sale of motor trucks and delivery wagons as an extension of their activities, and most of the others are or have been experimenting with the same end in view as soon as it shall become apparent that the rapid increase of manufacturing facilities threatens an overproduction of pleasure cars.

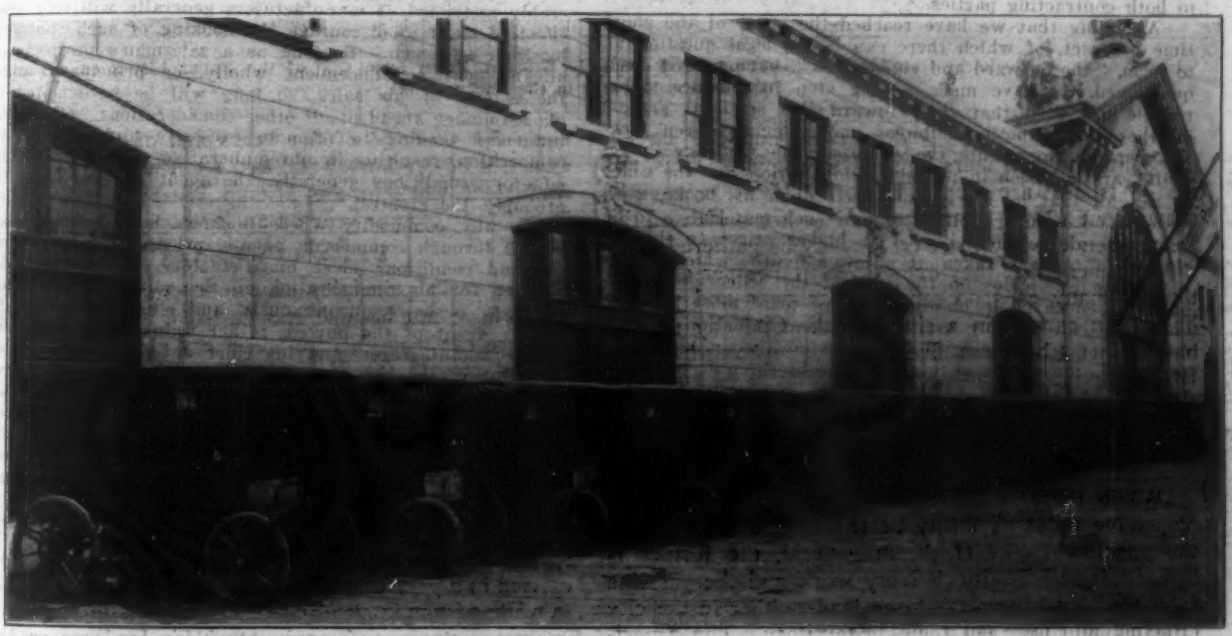


Fig. 1.—Electric Delivery Wagons Used for Retail Delivery Work in New York City Built by the Studebaker Brothers Mfg. Company, South Bend, Ind.

This is the insurance that automobile manufacturers are investing in during the years of prosperity.

Many manufacturers have entered the commercial vehicle field solely in the belief that the development of the commercial vehicle should not wait for production to overtake demand in the pleasure car field, and that a special knowledge and experience apart from that gained in the manufacture and sale of runabouts, touring cars, and town cars is essential to the design, construction and sale of machines for transporting dead loads.

Carefully compiled records show that there are now very nearly 100 active builders of motor trucks, delivery wagons and other special forms of industrial motor vehicles in the United States. Some have a very limited output, but others are either known to be or claim that they are turning out from 25 to 50 machines a week. Unfortunately, there are no reliable data that even approximate the true conditions, either as to the production or the use of such vehicles.

City Delivery Work

There are estimated to be over 4000 commercial motor vehicles in use in New York City, which takes the lead in this respect. The most extensive users are the express companies, the public service corporations, department stores and dry goods houses, delivery contractors, breweries, silver ware and jewelry establishments and large retail merchants in various lines.

It is the expressed intention of some of the largest users to supplant all their horses with motor equipment as rapidly as will be consistent with good business judgment. The H. C. & A. I. Piercy Company, which does all of the delivering for more than 80 retail firms in Manhattan and Brooklyn, and formerly maintained 200 wagons and trucks and about 300 horses, has already installed 30 electric wagons of the type shown in Fig. 1, and has placed a blanket order for 300, to be delivered as called for, with the purpose of displacing all of its horse equipment as fast as the company can convince its patrons of the superiority of motor service.

Another instance that is indicative of the trend of the times is the decision of Gimbel Brothers to do all of the transfer and delivery work in connection with their recently opened New York store with motor trucks and delivery wagons. Five new 3-ton gasoline trucks have been ordered for the hauling of goods to the outlying depots in half a dozen different parts of the metropolitan district, to be distributed to the houses of customers by electric wagons of 1000 and 2000 lb. capacity. It will thus be possible to deliver all purchases within 24 hours to points within 30 miles of the store. The system is based on a total service of 100 motor cars.

John Wanamaker has recently installed a unique delivery system, the main feature of which is eight 3-ton gasoline trucks, built with removable inner bodies. These inner bodies or crates are mounted on small iron wheels, so that they can be withdrawn from the closed bodies of the trucks at the rear and rolled upon hand trucks, which are run upon large freight elevators and taken to any floor in the store to be loaded. While this loading is going on a loaded crate can be placed in the motor truck, as shown in Fig. 2, and sent away to one of the outlying stations of the

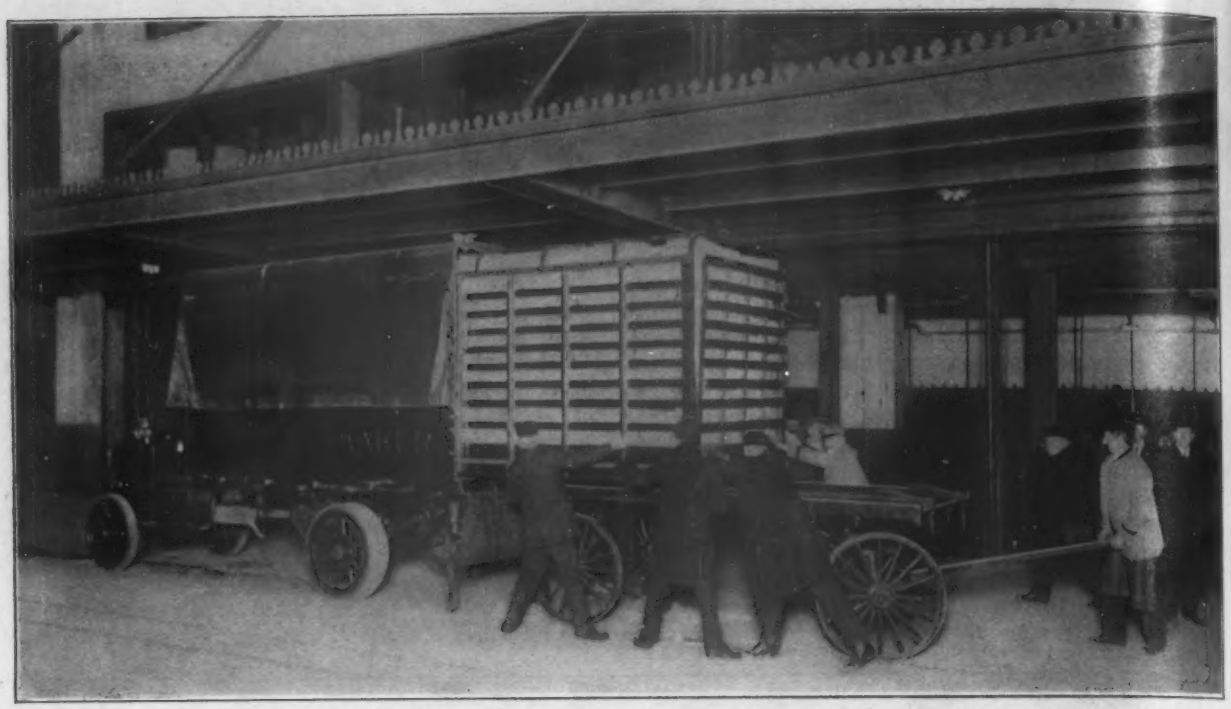


Fig. 2.—Loading a Large Gasoline Truck.—The Loaded Crate Is Brought Down from One of the Upper Floors on a Hand Truck on the Elevator in the Background.

store, where the crate is drawn out and the parcels distributed to customers by smaller wagons. Thus, the costly trucks are kept at work almost constantly throughout 18 out of the 24 hours. Some idea of the service rendered by these trucks may be gathered from the statement that they average 115 miles per day and that as many as 3000 separate packages and parcels have been carried in a single load. One day shortly before last Christmas five loads were hauled to the Bronx station at 177th street, a distance of 10 miles, which were sufficient to keep 25 horse-drawn wagons busy with local deliveries throughout the day.

Fields of Both Classes of Vehicles

While there is no well defined line dividing the respective fields of utility of the electric vehicle and the gasoline motor truck, in general, the former is better adapted to city delivery work and the gasoline truck to long hauls with large loads, either in the city or to points in the surrounding territory. The American Express Company has operated 15 3-ton gasoline trucks, built by the same maker as that illustrated in Fig. 3, for more than a year, running each machine 20 hours a day when the work was heavy. The trucks are operated on a regular schedule resembling a railroad time table, with fixed hours of arrival at and departure from outlying express stations. The longest run without a stop is 12 miles, and the route is covered in a little more than one-third of the time formerly consumed by horses, the regular time allowance being 70 min. Complete records show that the motor trucks have about 30 per cent. greater capacity than the horses and wagons used by the company, while the total expense for operation and upkeep has been just about the same for a 3-ton motor truck as for a wagon of equal capacity and the two teams of horses required for hauling it, with a change at noon.

Operating Cost

The question of probable cost of operation and upkeep is one that a prospective user of a motor truck or delivery wagon is most interested in, after he has satisfied himself of the dependability of the mechanism. Such costs vary, but in one case it was found in actual service that a 3000-lb. motor truck was able to take care of the work formerly done by four teams and a 4000-lb. wagon at only a little more than one-third of the daily cost. The cost of operating an electric 1-ton delivery wagon based upon the experience of users for a period of five years and of the operating expenses of five horses and two 1-ton wagons to do the equivalent work in the Middle West showed a saving of $1052.77 per year on an investment of $2000.

Details of Construction

The main principles of construction of these vehicles have not become standardized, as they have in pleasure car manufacture and every general statement has its exceptions. However, in gasoline trucks of 3 tons capacity and upward the prevailing practice is to employ a four-cylinder, vertical, high-speed internal combustion engine having mechanically operated valves, magneto ignition, pumped water circulation and force-feed lubrication. This engine is mounted at the forward end of the frame. The transmission or speed changing mechanism is of the sliding gear type carried in a gear box under the center of the truck, and is made of ample size and good material to stand the enormous stresses of moving such big loads up grades and through heavy going. The final drive is invariably by roller side chains from a differential countershaft to sprockets on the rear wheel brake drums. The axles are solid one-piece forgings, the rear axle usually of square section and the front axle of I-section. The wheels are usually of wood, though a few pressed steel disk wheels are in use and run on taper roller bearings. In the best examples the countershaft and sliding gear shafts run on roller or annular ball bearings.

Frames of the largest gasoline trucks are now variously made of pressed steel, rolled channel steel or armored wood according to the convictions of the

Fig. 3.—A 3-Ton Gasoline Truck, Built by the American Locomotive Company, New York City.

Fig. 4.—A 7-Ton Gasoline Coal Truck with Special Side Discharging Steel Body Built by the R. L. Morgan Company, Worcester, Mass.

builders. They are supported on the axles by heavy leaf springs of platform type. The driver's seat and the dash are built as an integral part of the chassis, but invariably the body is a separate unit, the chassis being so designed that any preferred type of body may be put on. This method is not peculiar to the class of heavy gasoline trucks, but applies to all sizes and kinds of modern motor vehicles.

Although there are some notable exceptions, it is a characteristic of American trucks to have the driver's seat directly over the engine compartment with the radiator forming, or immediately in front of and partly below, the dash. The European practice has been to follow touring car design, in which the dash and driver's seat are back of the engine, where the seat and foot boards, with their pedals, steering column and dashboard attachments occupy considerable space in the middle section of the frame. This makes it necessary to give the body a great overhang beyond the rear wheels and brings the weight of practically all of the load on the rear axle. Some of the European builders are now adopting the American plan of putting the driver over the engine, where he has a better view of the traffic, and utilizing all of the space back of the engine for loading. This permits of a shorter wheel base and less overhang, so that the machine can be turned and maneuvered more readily in narrow streets and confined quarters, and the load will also be more evenly divided between the front and rear axles.

Gasoline delivery wagons and light trucks up to 1 ton and 1½ tons capacity vary widely in design. But when the construction does not follow the plan already described it usually embodies a two-cylinder opposed engine placed horizontally in the frame. In the heavier vehicles it is commonly under the middle of the frame, and in the lighter ones is most often placed across the front. In at least two well-known makes the engine and its attachments are mounted slidably in the frame so that the engine can be drawn forward and removed bodily if desired. Should examination show that extensive work upon the engine is required, another engine or complete power plant can be substituted for it very quickly, and the vehicle sent about its work while the deranged engine is undergoing repairs and adjustments in the shop.

In these lighter trucks and delivery wagons planetary gear systems are commonly fitted for securing changes of speed with single roller chain drive to a differential gear on a countershaft and final drive by a pair of roller side chains. Pressed steel, armored wood and rolled angle or channel steel are generally used for frame constructions, with a growing tendency toward the first as best for the purpose. Within the last year several shaft drive commercial vehicles have made their appearance, and are now undergoing practical service tests in the hands of buyers.

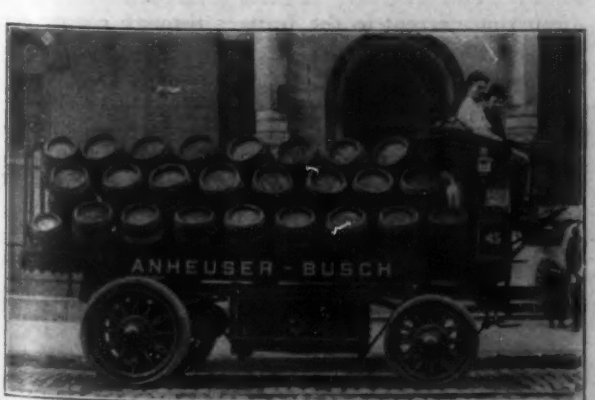


Fig. 5.—A Heavy Electric Truck Built by the Studebaker Brothers Mfg. Company, South Bend, Ind.

Electric Vehicles

In their general points, electric trucks and delivery wagons are quite similar, almost universally having channel steel frames, railway type motors, side chain drive and underslung batteries. The bodies are independent of the chassis and interchangeable. A single motor is used on wagons and trucks up to 1-ton capacity, with silent chain drive to a differential countershaft giving one speed reduction, and side chains to the road wheels giving a second reduction. It is common practice to use twin motors on the larger trucks up to 5 and 7 tons capacity, with a single roller chain driving from the armature shaft of each motor to the rear wheel on the same side of the vehicle. Using two motors makes a differential countershaft unnecessary, as the two armatures may turn at different rates and so compensate for the difference in rotation of the inner and outer wheels of the truck when turning. Practically all motors are now hung from the main frame members, so that they get the benefit of the spring suspension and the whole construction is thereby saved from unnecessary racking and vibration. Speed changes, starting, stopping and reversing are all accomplished in the electric vehicle by means of a controller and controller handle, which govern the amount and direction of electric current flowing to the motor.

Many improvements have been made in electric commercial vehicles during the last five years, and in their storage batteries also, so that they are far more efficient and reliable than formerly. The weight has been reduced, they have been provided with antifriction bearings, spur and internal gear drives have given way to the less noisy and more flexible chain drive, motors have had their armatures mounted on ball bearings and their windings improved and a new type of battery has been placed in the market that weighs only about half as much for a given output of energy as the old type and requires no more attention than filling of the jars twice a week with pure water and an occasional external cleaning of the jars.

A 1000-lb. delivery wagon fitted with one of these batteries weighing 700 lb. regularly covers a route of 43 miles a day on one charge, making an average of 175 stops to deliver packages in the service of a New York dry goods house, and a 1-ton wagon fitted with a 1200-lb. battery has run between 87 and 90 miles on suburban routes, making deliveries along the way. This wagon regularly covers from 63 to 67 miles a day with an average of 150 deliveries, and has maintained these averages since last fall without missing a working day. This is all the work that the driver and his helper are physically able to handle, so that there is no requirement for greater capacity.

Norwegian Electric Furnaces

Notes on Their Use in the Manufacture of Steel

At the meeting of the American Electrochemical Society in Chicago, October 15 to 19, 1910, the secretary, Prof. J. W. Richards, made a verbal report covering his investigation of the use of electric furnaces in Norway and Sweden and specially referred to the Hiorth and Soderberg electric furnaces. In the following are given a translation of a Swedish paper which deals with the experience with a Hiorth installation, and a brief description of the Soderberg electric induction furnace.

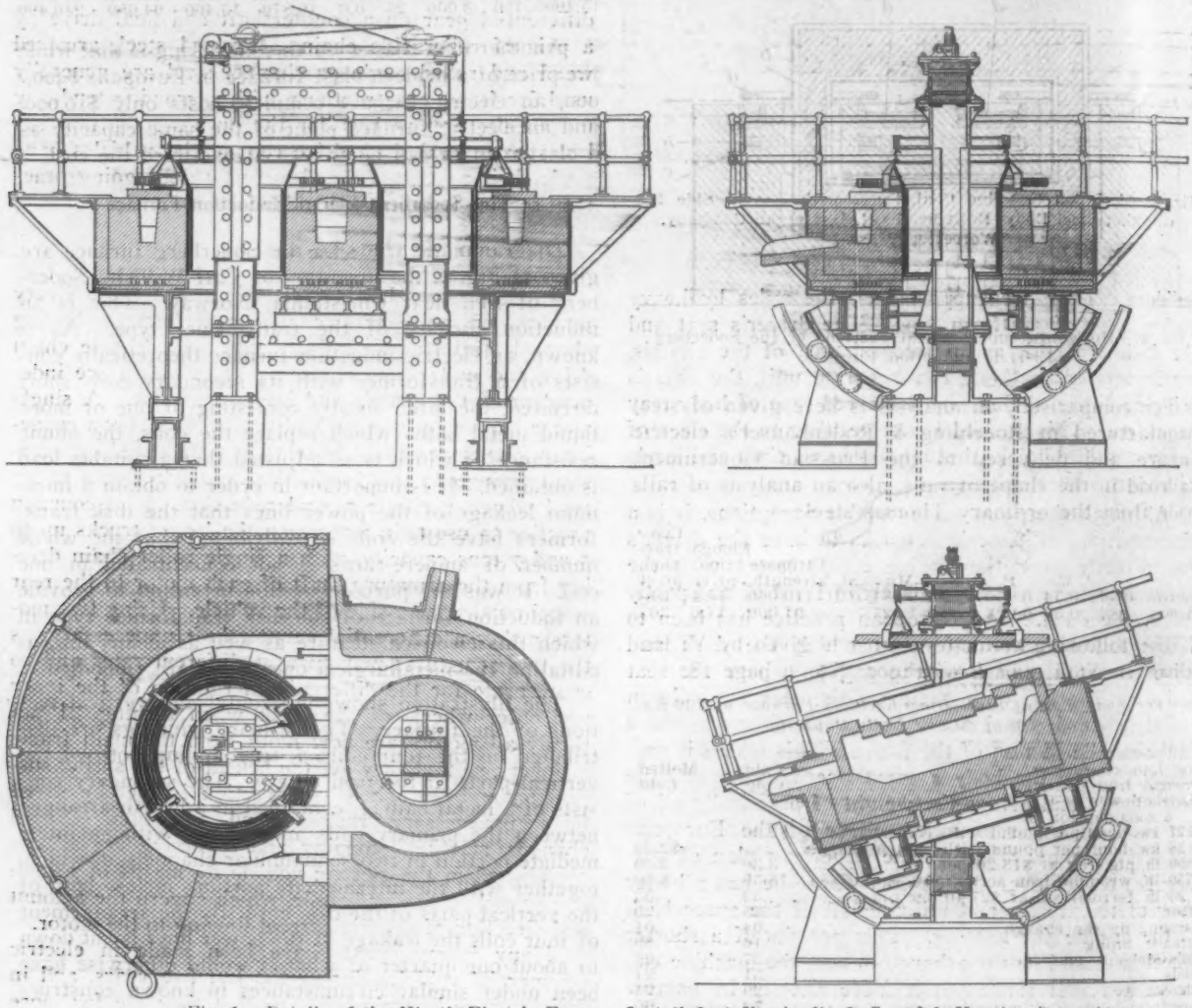


Fig. 1.—Details of the Hiorth Electric Furnace Installed at Yossingfjord, Sagndal, Norway.

Notes on the Manufacture of Steel and on the First Electric Steel Mill in Norway

Steel manufacturers have shown little interest in the electrochemical production of steel and such electrotechnical men as Ferranti, Heroult, Kjellin, Stassano, Girod and others are to be thanked for the development of the electric furnace. Progress in this field is very recent, and as late as 1905 there existed but few furnaces, a Kjellin furnace at Gysinge, Sweden, a few Heroult furnaces (in Sweden, Savoy and Westphalia) and a Keller furnace in France, while now about 60 furnaces are running or under construction. A few years ago the capacity of the furnaces was exceedingly small, averaging 1 ton, while some of the new furnaces reach a capacity of 15 tons.

A plant has been installed at Yossingfjord, Sagndal, Norway, which uses a furnace patented by A. Hiorth. This furnace is shown in Fig. 1. The furnace is heated by means of upper and lower induction coils. The lower induction coils are water cooled and the upper as well as the magnets are self-cooling. The essential feature of this furnace is that it is a combination induction and electrode furnace. Between the electrodes is a wall made of such hight that it will separate the metal in the bath, but let the slag bridge across. The current arcs over from the electrodes to the slag, heating this and enabling the metal to be refined, as is done in the open hearth process.

At this plant about 2000 hp. is available in water power. The generator delivers 250-volt, 12.5-cycle alternating current to the furnace through copper cables 1.58 in. in diameter.

One of the greatest difficulties was found to be in obtaining a fireproof lining that would stand up to the extreme temperatures obtained in the electric furnace. In isolated instances it was found that even magnesite would melt. But the furnace as now constructed works admirably, both from a mechanical and metallurgical viewpoint. The bath is exceedingly quiet and the electrical efficiency is surprisingly high, the power factor averaging 0.75 to 0.8 and at times reaching 0.84.

Some of the steel manufactured has been tested and analyzed, with the results appearing below:

No.	Mark.	Diameter, inches.	Sectional area, square inch.	Elastic limit, lb. per sq. in.	Modulus of elasticity.	Elongation at elastic limit, per cent.		Ultimate strength, lb. per sq. inch.	Elongation measured on 8 in. per ct.	Greatest contraction, per ct.
58,277	0.60	0.590	0.274	54,600	...	0.187	...	100,000	12.3	31.7
58,278	1.00	0.593	0.277	65,600	...	0.230	...	138,000	2.3	2.3
		C.	Si.	Mn.	S.	P.	W.			
58,277	0.60	0.56	0.14	0.61	0.026	0.031	0.03	....	...	...
58,278	1.00	1.00	0.16	0.56	0.015	0.026	...	....	...	...

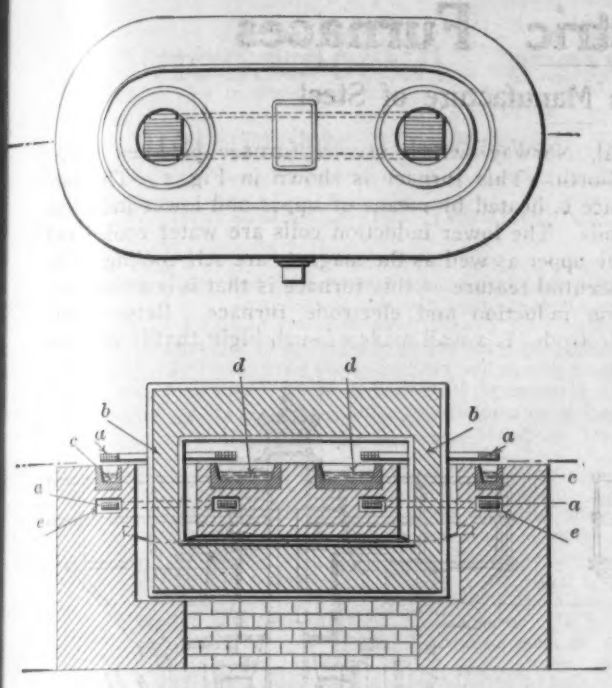


Fig. 2.—Horizontal and Vertical Sections of the Soderberg Electric Induction Furnace.

For comparison, an analysis is here given of steel manufactured in Roechling & Rodenhauser's electric furnace and delivered to the Prussian Government Railroad in the shape of rails, also an analysis of rails made from the ordinary Thomas steel:

	C.	P	S.	Mn.	Si.	Ultimate strength.	Elongation, pr. ct.	Contraction, pr. ct.
Electric steel	0.54	0.056	0.042	0.984	0.21	119,000	15.4	24.1
Thomas steel	0.36	0.073	....	1.127	...	97,000	17.6	26.2

The following estimate of cost is given by V. Engelhart in *Stahl und Eisen*, 1905, No. 3, page 18:

Cost Per Long Ton of Steel from Kjellin's Furnace of 736-Kw. Capacity of 30-Ton Daily Capacity.

All costs per long ton:	Cast iron charge.	Wrought iron charge.	Melted. Cold.
Electric power at 0.477 cents per kw.-hour and a consumption of—			
0.27 kw.-hour per pound with cold charge	$2.90		....
0.23 kw.-hour per pound with melted charge	...		$2.39
550 lb. pig iron at $13.20 per ton	3.30		3.30
1,750 lb. wrought iron scrap, $10.70 per ton	8.50		8.50
26 lb. ferrosilicon at $27.40 per ton	.33		.33
Labor	.35		.29
Warming up the charge	.04		.04
Furnace lining	.10		.09
Miscellaneous materials	.27		.27
Molds	.31		.24
Interest, &c	.29		.24
Superintendence and miscellaneous	.72		.60
Totals	$17.11		$16.29

It appears that the only item that can vary to any extent is the cost of electric power. *The Electrochemical and Metallurgical Industry* (June, 1909, page 266) gives the cost per kilowatt year at $51 and the cost of molten Thomas steel at $15.54 per ton, and figures the cost of steel rails at $18.62 per ton and boiler plates at $19.78. The melting of 6 or 7 tons of steel requires 1 hp.-year, and figuring with a cost of $8.02 per horsepower-year and scrap iron at $14.70, the melting costs will amount to $4.15, and allowing for royalty on the patents the steel can be delivered f.o.b. at $20 a ton. It may be noted that the quotations in the fore part of this year were $27.50 for Bessemer and $28 for open hearth steel billets, and for best grade open hearth ingots $30 at English mills.

But it is particularly in the finer grades of steel where the electric furnace will make the greatest inroads. To pour 7 tons of crucible steel will take 200 crucibles and a large force of skilled labor, while an electric furnace will melt this quantity in one charge. In fact it is predicted that the electric furnace will eventually entirely replace crucible steel.

As to cost of power, it may be pointed out that the Swedish Government has obtained power at $4.54 per horsepower per year at an outlay for power station of $36.50 per horsepower at Trolhätta, and it would be possible in favored localities to obtain power at $4 a horsepower at an outlay of only $27 a horsepower.

The Electrochemical and Metallurgical Industry (June, 1909, page 265) gives the following table for various sizes of the Roechling-Rodenhauser furnace:

Capacity, pounds.	Kw.	Volt.	Cycles.	Cos. φ	Cast in pounds. Production per day. Cold charge.	Molten charge.	Cold charge.	Molten charge.
2,200	175	500	50	0.8	1,540	2,200	9,240	35,200
6,600	350	3,000	50	0.6	4,620	6,600	27,720	106,600
11,000	550	3,000	25	0.65	7,700	11,000	46,200	176,000
15,400	750	3,000	25	0.6	10,870	15,400	64,680	246,400

Another item that is worth considering is that while the price of a modern blast furnace in Europe is $400,000, an electric furnace complete costs only $10,000, and an electric furnace plant of the same capacity as a blast furnace can be erected at one-third the cost.

The Soderberg Electric Induction Furnace

Diagrammatic views of the Soderberg furnace are given in Fig. 2, the invention of Carl Wilhelm Soderberg of Ski, near Christiania, Norway. This is an induction furnace of the transformer type. As is known, an electric induction furnace theoretically consists of a transformer with its secondary coils short circuited, the latter mostly consisting of one or more liquid metal baths which replace the coils, the ohmic resistance of which is so adjusted that a suitable load is obtained. It is important in order to obtain a minimum leakage of the power lines that the disk transformers have the coils so distributed that the whole number of ampere-turns is not concentrated in one coil. It was the purpose of this invention to provide an induction furnace of the disk transformer type in which this electrical feature as well as means for facilitating the metallurgical operations are embodied.

The illustration shows horizontal and vertical sections of the furnace. The primary windings are distributed on the four coils *a*, surrounding both of the vertical parts of the iron core *b*. The secondary consists of a metal bath, *c*, contained in a hearth arranged between the primary coils and formed with an intermediate portion in two semiannular channels, *d*, which, together with the intermediate portion, inclose both of the vertical parts of the iron core. By the arrangement of four coils the leakage of the power lines is cut down to about one quarter of what it would otherwise have been under similar circumstances in known constructions of induction furnaces of the disk transformer type having iron cores.

The lower primary coils are cooled by currents of air which pass through channels, *e*, in the foundation of the furnace, which may be of masonry or any suitable material, as the effect of the intensity of the current is proportional to its square. The above mentioned cooling diminishes the resistance and the intensity of the current is increased. The efficiency of the furnace per unit of time thus increases, an advantage which is the more important in this construction, because the coils inclose both of the vertical legs of the transformer.

To facilitate the metallurgical operations, which are rendered difficult on account of the primary coil covering part of the metal bath, the extended parts of the bath are situated outside of the current carrying parts of the bath and not covered by the primary coils. Such channels have been used in some prior constructions, but never in furnaces of the disk transformer type for the above mentioned purposes of providing working space, and facilitating the metallurgical operations, the feed and the treatment of the slag. Repairs may be easily made without removing any part of the primary coils of the furnace.

The National Founders' Association

Fourteenth Annual Convention, Chicago, November 16 and 17, 1910

Diminishing Labor Troubles Give a Better Opportunity for Construction Work

The National Founders' Association held its fourteenth annual convention at the Hotel La Salle, Chicago, November 16 and 17. The interest taken in the affairs of this organization is shown by the excellent attendance, the enrollment reaching 165 names, among them being an unusual percentage of the largest employers of foundry workmen. Labor troubles being comparatively unimportant at present, the proceedings and discussions had little to do with strikes or kindred subjects, and the attention of the convention could therefore be given to the consideration of broader questions affecting the relations of employers and their workmen. One of the most important topics which thus came up for extended discussion was the liability of employers for industrial accidents. Throughout this discussion no disposition was shown to treat workmen other than fairly in the adjustment of compensation for accidents happening in the discharge of their duties. Industrial education also came in for a good share of attention. President O. P. Briggs brought out a most important point in his report in dwelling upon the fact that there are good unions as well as bad ones, commending those practicing "open shop unionism," whereby the members do not refuse to work with nonunion men. Upon this point the public appears to be sadly in need of education.

THE OPENING SESSION

The session on Wednesday morning was taken up with routine matters, such as the appointment of committees and reports of officers. President Briggs named the following committees:

Finance Committee.—C. Bermingham, Canadian Locomotive Company, Kingston, Ont.; G. E. Emmons, General Electric Company, Schenectady, N. Y.; H. Woodland, Allis-Chalmers Company, Milwaukee, Wis.; E. L. Dawes, Standard Sanitary Mfg. Company, Pittsburgh, Pa.; W. S. Winslow, Winslow Bros. Company, Chicago.

Resolutions Committee.—H. D. Miles, Buffalo Foundry & Mfg. Company, Buffalo, N. Y.; C. N. Power, St. Paul Foundry Company, St. Paul, Minn.; A. N. Abbe, American Hardware Corporation, New Britain, Conn.

Nominating Committee.—H. A. Carpenter, General Fire Extinguisher Company, Providence, R. I., chairman.

The President's Report

The report presented by President Briggs was a comprehensive review of the affairs of the association, in part as follows:

The fourteenth annual convention of your association closes a year of practically normal prosperity in the foundry industry. Neither extreme activity nor dullness has prevailed for any length of time or in any large number of industries. That branch of the business with which this association was organized to cope, the labor branch, has been, insofar as labor difficulties are concerned, rather more active than the year before. The efforts of the union with which this association has to contend have been directed against quite a large number of foundries, by far the largest portion of them, however, outside of the membership of this organization.

MEMBERSHIP.

The membership of the association has increased handsomely as you will note from the secretary's report. Your Council has considered several applications for membership which have not been accepted, it being the policy well defined by the Council for several years to admit none to the association who do not have a record of treating their men fairly and carrying on a successful and enterprising business, irrespective of the size of the firm.

Had your Council been disposed to admit all classes of foundrymen, irrespective of standing in this regard, the membership during the last year could have been further increased very materially. The wisdom of the Council in this respect requires no comment of mine.

GOOD AND BAD UNIONISM.

During the year there have transpired many cases of interest to those who believe that the question before the people who wish this problem solved permanently is not that of unionism or non-unionism but of good or bad unionism.

I believe I have referred to this subject in every report I ever made you. It is most gratifying, at this time, to note several cases in which marked progress seems to have been made, also several cases verifying citations I have made as to open shop unions. I may perhaps be a little vain in this latter respect, due to the fact that my statement of 1906 that certain railroad unions were open shop unions has been discredited.

I refer particularly to the Brotherhood of Locomotive Engineers. I have stated that, while being one of the strongest unions in the United States, the members never refuse to work with non-union men. In proof of my statement, I wish to call your attention to a public utterance recently made by Warren S. Stone, grand chief of this organization, in which, commenting upon this question, he says:

> I do not believe in forcing men to join a union. If a man wants to join, all right; but it is contrary to the Constitution and the principles of free government to try to make him join. We of the engineers work willingly side by side with other engineers who do not belong to our union, although they enjoy without any objection on our part the advantages we have obtained.

Again, I wish to call your attention to a recent publication in the *Century Magazine* of September, where the above statement is practically reiterated. The *Century Magazine* is sponsor for the statement that this is the most powerful union on the globe; that it has within its ranks 90 per cent. of the workingmen in that craft; that there has been no strike of any importance with these engineers since 1888—22 years, mind you, with no strikes. To those who are not posted, this article in the *Century Magazine* is a revelation in unionism.

I repeat what I have said to you on numerous occasions in regard to this organization, that it is one of the best organizations of men known on this continent. It is inspired by a spirit of fairness, a brotherly love, a desire to help the craft and place it in as prominent position among other trades as possible.

Scarcely less important and noteworthy are the conductors, who pursue the same policy, and have had practically the same results, having no strikes of any magnitude whatever, for many, many years. Following closely upon the methods of these two unions come the Brotherhood of Railroad Trainmen and Brotherhood of Locomotive Firemen and Enginemen. Would that the methods of these unions could be exploited. Especially is it desirable, and in my judgment demanded, that these facts be placed before the non-employing public, the educators, clergymen, and statesmen more especially.

CLOSED SHOP UNIONS.

Strangely contrasted with the purposes and methods of these open shop organizations come the unions allied as the American Federation of Labor, and I wish here to call your attention to another step in the history of that organization which has been written since we convened last. I refer to the last convention of the American Federation of Labor, which was held almost coincident with our convention in November, 1909.

Pages might be written in regard to these American Federation of Labor conventions, but the whole undertaking of this organization is best sized up in the proceedings of this last convention, published in a book of 352 pages. Read this book from cover to cover, and you find not one word of a report of any effort, undertaking or desire on the part of the officers of this American Federation of Labor to make one single move in any manner, shape or form, to assist their employers; and, worse yet, you find not one iota of an effort put forth having for its object creating friendly relations between employer and employee.

On the other hand, from start to finish it brands the employers of this country as tyrants. In proof of my as-

sertion I want to call your attention to just one of the acts of this convention on the question of injunctions, and its action in the case of the Buck's Stove & Range Company, which is now in the hands of the Supreme Court of the United States. Its action upon this question is typical of all its acts and shows a most wanton disregard for and defiance of the laws of this country

I beg of you to weigh the action of this American Federation of Labor convention upon this subject, and especially consider the position taken by Gompers and Mitchell. Boycotts have been declared illegal in some 46 States in this Union. They have been declared illegal for years and years in England. No one on this continent is better aware of that fact than the two gentlemen named —Gompers and Mitchell.

Here you find these great leaders of the American Federation of Labor, in convention assembled, counseling, advising, and by act of its convention directing that their followers disregard and defy the law, and when they are dissatisfied with a court ruling, they are advised by Mr. Gompers, supported by act of its convention, and emphasized by a vigorous speech of its vice-president, John Mitchell, to take the law into their own hands, and do as they please.

No one knows better than Gompers and Mitchell that this action on behalf of this convention and the attitude of these officers are little less than treasonable. So far as the action of these officers is concerned, personally, it amounts to but little, but think of the effect it has upon their following.

This report of the convention of one year ago is teeming with sentiment hostile to the employers on every hand. Not a friendly word for the employer is in it. It is spread to some two millions of people directly, and indirectly a great many more working people have access to these reports.

EFFICIENCY OF WORKINGMEN AND HIGH COST OF LIVING.

The public mind and press are full of agitation, condemnation, and adverse comment upon the high cost of living prevailing at the present time. The sentimentalist has his reason for it; the politician has his reason; the workman has his reason, and the non-employing public has its reason.

Nobody knows just who is right, but as touching upon the enterprises in which the members of this organization are engaged, I wish to refer to the subject, coupled with the efficiency of workingmen generally, and I spread this efficiency phase of it beyond the confines of the molders' trade.

The condition of the working people of this country, compared with those of other countries, is the best on the globe. This is conceded by employers and employees, members of labor unions and non-union men, wherever and whenever investigation has been made and an honest opinion given.

Our workingmen are receiving from two to three times as much annual wages; their living expenses are not to exceed 60 per cent. more than those of any other country on the globe; for which reason, comparatively speaking, their condition on this continent to-day is as near ideal as anything we have, enabling them to enjoy more of the luxuries of life than any other people of their class.

Notwithstanding this, they are dissatisfied, discontented, and uneasy, believing they are not getting that which is their due. As a result of this discontentment, this unsatisfied condition of mind, their efficiency is at an extremely low ebb. There is scarcely a member of this association who has not had experience touching upon this point directly, where the working people are prone to limit the amount of work done to a most unreasonable extent.

As an illustration generally, I wish to step outside of our particular trade for just a moment. I recently had an opportunity to examine the costs of manufacturing lumber in one of the great lumber institutions of the Pacific Northwest.

It is the custom of many of these lumbermen to contract the delivery of their logs on stream or railroad at so much per million feet. Contractors whose sole business is cutting these logs are numerous in that country. In the case I examined, a contract had been taken several years ago, covering a period of five years. This contract was based upon the employment of 10 men, to deliver 1,000,000 ft. of logs in a certain manner.

This was based upon actual experience. During this five years considerable improvement had been made in improved methods of handling logs, but, omitting these improvements entirely, for the last two years of the contract it required 35 men per 1,000,000 ft. in place of the 10 men upon which the contract was based. In other words, the efficiency decreased to the extent of its costing three and one-half times as much to perform that portion of the work, not including a raise in wages which occurred. This was a fair criterion by which to measure the entire cost of manufacturing lumber from the cutting of the logs to delivery at the lumber yard.

At a glance you will observe that the raise in wages during that time is insignificantly small as compared with the inefficient service rendered.

This condition prevails to an alarming extent in all lines of trade, and without doubt is caused by discontentment in the minds of the workmen. Manifestly, it has much to do with the high cost of living.

I believe the cause for this discontent originates with the leadership of the American Federation of Labor. The effect of the acts of that organization can be nothing less than a disturbance of the state of mind of the working people. Added to this influence, too many of our leading people in public life are continually supporting these labor leaders. Would that the politicians of the country to-day, who are going from town to town in special trains, espousing the cause of the working people, prolific in their statements of what they propose to do for labor, and what ought to be done for labor, could dwell for a moment with the essayist who said: "A contented mind is a continual feast," and would that they could direct their great energies along reasonable lines first, to showing the working people of this country that they have the best there is on the globe in their particular class or occupation.

LABOR LEGISLATION.

Throughout the different States a great deal of legislation has been proposed. Not many very extreme measures have been passed. The same is practically true in national legislation.

The most difficult problem of this kind your officers have had to contend with is the proposed anti-injunction legislation that was pending before Congress last winter. Certain officials of the Government were extremely anxious that an anti-injunction bill be passed. Your committee felt that any disturbance of the present court practice in injunction cases would be inimical to the welfare of employee and employer.

It is to be regretted that prominent political parties feel that the present method should be changed. Many of our officials advance the argument that the proposed change is merely a writing into statute of the practice of the equity courts to-day. For the sake of argument, admit it to be true. My great objection to such modification of the injunction procedure is the fact that it opens the doors wide to further amendments and modifications of this procedure. I care not what the law may be that this United States Government may enact. Let the politicians once disturb a precedent that is now as old as the Government itself, a practice that has been most beneficial to the working classes, and which at its inception had for its purpose the protection of the working people, and within an inconceivably short time you will see the precedent of modification of this injunction procedure forced by the other side until the radicals, anarchists and socialists who are so concerned about this court procedure will have secured such a law as they want.

If the newspaper accounts of the attitude of the White House for the incoming session of Congress are correct, this same proposed legislation will be forced to the front the coming winter. I cherish the hope that proper ways and means will be provided for discontinuing this effort, and urge that a committee be kept in readiness to cope with the situation.

THE SHORTER WORK-DAY.

While to the membership at large the question of a shorter workday has not appeared very pronounced during the year, to your officers who have been watching the trend of affairs continuously several important points have been noted, until, in my judgment, it is now advisable that this convention take it up for consideration.

The goal of the Iron Molders' Union, especially its president, has been 8 hours, with 10 hours' pay, with the idea that if they ever reached 8 hours, the next step would be 7, and then 6. In fact, demands have already been made by the Iron Molders' Union upon the Stove Founders' National Defense Association that the hours of molding in stove shops shall be reduced from 7 to 6.

In 1907 the presidents of the Iron Molders' Union and the Machinists' Union, respectively, were successful in negotiating an agreement with the foundrymen and employers of machinists in San Francisco whereby they were to reduce the working hours 15 minutes every six months, until eight hours was reached. That point was reached in June last. A condition was attached to this agreement, whereby these two unions agreed to have in effect at that time the 8-hour day both north and south of San Francisco. The 8-hour working day had not been established at that time in the Pacific Coast territory except at San Francisco, notwithstanding the fact that these unions had made aggressive efforts, placing on strike a large number of employees in both foundries and machine shops. The proprietors in San Francisco determined to take a stand and avail themselves of this opportunity to abrogate the agreement for shorter hours. They so notified the unions, the result of which was a series of conferences and a final referring of the entire matter to what is known as the San Francisco Conciliation Board, which, as reported by the secretary of the California Metal

Trades Association, has conceded eight hours for another year.

These two unions, by way of their officers, have been extremely pronounced in their statements that as soon as the shorter work day was established in San Francisco and other coast points, as was contemplated, they would then establish it in short order on this side of the Rockies. Up to the present time we have had no strike where the question of hours was the only issue, notwithstanding which there have been demands for shorter hours in several localities within our territory.

I hope I may be pardoned for suggesting in this report and at this time the advisability of resisting a shorter workday. I do not believe in it, taking the viewpoint of the workingman alone, irrespective of the viewpoint of the proprietor. Years ago, when machinists and molders worked 12 and 15 hours per day they were justified in individually and collectively attempting to reduce the hours. The hours were reduced, and be it said to the credit of this organization that no body of men in the world has brought working hours down to their present state more freely, willingly and quickly than the foundrymen of this country. Their action in this respect is proverbial.

There comes a time, however, when reduction of hours must cease, or the workmen will not get their just dues. Manifestly, if we reduce working hours, the cost of the article produced must be raised. The present high cost of living is now at a point where further increase seems almost intolerable by the working people.

In my judgment it is not possible for the working classes to produce the consumption of this country in 8 hours, neither do I believe they can produce it in less than 10 hours. I believe that the majority of working people in a degree realize this. I believe, if they could have the say, that a vast majority would vote to-day for 10 hours' work and 10 hours' pay, believing that depriving them of working this length of time is taking from them that which is their greatest wealth, the power of producing a livelihood by the sweat of their brow.

I do not wish to be understood as saying that all classes of workers should be on the same schedule of hours. Far from it. This is where the unions make a horrible mistake in attempting to secure the same working day for every class of artisans and laborers, irrespective of the trade or craft.

There are trades, crafts and occupations where 8 hours' work is more wearing upon the human system than 10 hours in other crafts, but for such trades as molders I do believe a shorter workday is extremely detrimental to their own interests.

The would-be friends of labor, especially of the political class, are continually demanding that something be done for labor. They shout from the housetops the fact that labor must be protected, cared for and considered.

It is an amusing fact that the majority of these agitators are not people who come up from the working classes. Few of them know what it is to put in a year's good, hard work, either as employer or employee. They lose sight of the fact that the very greatest thing that can be done for labor is to see that it has a job at good pay with reasonable hours, thus providing an opportunity for it to convert its efforts into the necessities of life, and if these so-called, would-be labor protectors wished to do something in the interest of this particular class, let them change their attitude of destruction to that of maintaining a job for them.

The Commissioner's Report

Commissioner A. E. McClintock's report is in part as follows:

The advent of spring of this year witnessed much unrest in labor conditions throughout the country. The public press contained extended and frequent comment on the increased cost of living. The many agents and organizers already in the field seized this opportunity and used it as an argument for workmen to align themselves with a union in order to get an increase in pay. This condition was felt in every branch of trade, in every part of the United States and Canada.

Foundries employing union molders began to receive demands from the molders' union early in January, the season having started about two months earlier than in previous years. From that time, until the middle of July, union foundries in 90 cities and towns of which we have record made adjustments of wages with their molders. The shops of 15 members of the association were involved in strikes. During the same period the molders went on strike at the shops of 88 non-members of the association, involving 1854 men, in 49 of which shops strikes are still being supported by the union. At the present writing, strike benefits are being paid to molders at 76 shops, originally involving 2364 molders and coremakers—13 of the above-mentioned 76 strikes having been started in previous years.

In the combating of these strikes, our members were confronted with the usual strike conditions with which so many of you are familiar. Our energies were directed toward using molding machines wherever possible, and placing under the instruction of competent molders as many boys and laborers as the shops could care for; in no instance did we attempt to rush in a large number of non-union molders to take the places left vacant, and thus hope to get satisfactory results.

Our members are profiting by the experience of strikes in association shops in previous years, and are rehabilitating their foundries by instructing a new crew of workmen recruited from the locality in which the shop is located. Many of these men who have worked about foundries and shops as laborers show marked ability when given help and encouragement. All of the above-mentioned shops are making steady progress and will be successful in establishing open shops.

FOUNDRY LABOR SUPPLY.

An adequate foundry labor supply has been a prominent topic at previous conventions. Your officers have had much to say on the subject, but it is a matter of such vital importance and has such an important bearing on the work of the association from day to day, that I feel it my duty to again bring it to your attention.

Every employer of labor knows that when trade is dull and workmen are plentiful the union agitator is less active, and that the reverse is true when business is good and workmen are in demand. Every foundryman has been through this experience many times.

Early in the month of January of this year, many foundries, members and non-members, found themselves in need of molders. Advertisements for "molders wanted" appeared in the daily papers. The officers of the association were in receipt of many requests for aid in procuring men. During February and March these calls at times would aggregate vacancies of 100 or more molders, and in some instances the firms would authorize us to furnish transportation up to $10 per man for the number wanted, they to reimburse the association promptly. These shops were not involved in strikes; they were simply short of molders and took these means of getting them.

Your officers found on investigation that considerable of the work for which molders were being sought could profitably be made on molding machines with handymen labor. In one instance, a jolt ramming machine was purchased and the firm was so well pleased that a second one was ordered. It was three months before the work on the machines was progressing in good shape, but the member is now convinced that this is a much more profitable method than importing molders from distant points, and being obliged to pay a premium. I mention this to illustrate the point that much of the demand for skilled journeymen molders could be lessened if each foundry would give more attention to educating its own workmen, and by improving the methods lessen the skill required on a vast number of jobs.

HOW TO EDUCATE UNSKILLED MEN.

In this matter of using handymen, it would be well to bear in mind the experience of others. Engage men between 20 and 35 years of age, pay them helper's or laborer's wages at the start, and put them in charge of an instructor or assistant foreman, who will give them constant attention. An advertisement in the local paper for young men wanted to learn a trade with good wages at the start will undoubtedly bring plenty of applicants, from whom the most likely can be selected. Start these young men, one or two at a time, selecting the simpler patterns first, and those from which possibly a number of castings are wanted. Have the instructor remain with them, watching every operation from day to day, advancing them to more difficult work as they improve. By this method, you will be enabled to provide a supply of foundry labor, which I venture to assert will be found much more satisfactory than molders recruited from a distance and unlikely to become permanent residents.

There are many members of the association who are doing their full share in this matter. They have found the training of their foundry operatives to be a profitable and satisfactory method of conducting their business. The policy of taking on green men and instructing them in molding, which is given such careful attention by these members, is doing more to promote the principles for which you have founded this association than all the dollars they may pay into the treasury as dues. In other words, the foundry proprietor who is devoting so much of his time and energy to the education of the raw recruit and thereby increasing the available supply of competent molders is certainly conferring a lasting benefit on the foundry industry as a whole which cannot well be measured in dollars and cents.

While on this subject, I wish to say a word regarding the old fashioned apprentice—the boy that is indentured and to whom an effort is made to teach the various branches of the trade. It is a pleasure to go into one of those shops where a systematic effort is made to keep a certain number of apprentices at work all the time. This policy is most commendable, and I urge you not to lose sight of it.

Those who are daily confronted with foundry labor prob-

lems cannot help but be impressed with the fact that a great many of the labor troubles of the foundrymen and much of the expense of the association are due to the scarcity of molders and core-makers. This condition, in my judgment, will never be overcome until a more widespread effort is made to impart a knowledge of the trade to a larger number of workmen.

MOLDING MACHINES.

During the past year the use of molding machines of the various types has been extended and a good healthy gain in that direction can be reported. In considering this subject, it is well to bear in mind that machine molding is still in its infancy and that constant advancement is being made and better results obtained by individual foundrymen who are giving careful constructive thought to the rigging of different jobs, the construction of flasks, etc.

Some months ago, I visited the shop of a member of this association who informed me that his molders were demanding more money; that his costs were already too high, and he was wondering what to do. It is a large and successful manufacturing firm, the foundry being one of a number of departments. He stated that they had used molding machines a great many years, and that their shop had everything in the way of equipment. I found they did have a number of machines, many of them designed and rigged up by the firm itself, and in some cases very much worn and in bad order. Other machines were modern and doing very well. Two power machines, of late design, which had been installed at considerable expense, were not in use and had been condemned. The member remarked that that particular type of machine was greatly overrated and he would be glad to dispose of the two for 25 per cent. of their original cost.

The shop impressed one as possibly 12 or 15 years ago having been advanced in molding machine practice. The superintendent had been with the firm over 30 years, is now past 60 years of age, and has slowed up without knowing it. I stated that other shops doing similar work were getting good results, and my first suggestion was that the proprietor take a few days and visit shops in other cities. This was something he had not done in years. A trip was planned, and after visiting four shops the proprietor in question said he was astonished to find how far his firm was behind the other fellow in many respects. He found power machines similar to the two he had condemned were being operated with marked success in other shops, and stated, instead of being willing to sell them for one-fourth their cost, that if he didn't have them he would order some immediately. He also found his flask equipment was much out of date, and with a different style of flasks, he saw in some cases two and in others three times the output being obtained on almost identical work. He saw handymen successfully making work more difficult than anything in his own shop.

Here is an illustration of a firm getting its foundry into a rut and resting quietly under the conviction that its methods were far advanced until called upon to give consideration to foundry wages and costs.

IMPROVED METHODS HELP THE OPEN SHOP.

Another case to which I would like to refer is that of a member operating a large modern foundry, run in connection with a manufacturing business. The foundry is the only closed shop department. About once a year they have a dispute about something with the molders or the union officials and are confronted with a strike. They have always hesitated about combating a strike, for the reason that they have a certain line of heavy floor work which is made in green sand and requires a high degree of skill in molding. When molding machines have been suggested, the head of the firm has always stated they have investigated the matter carefully and were satisfied there is no machine on the market suitable for this work. Until about six months ago, this was the honest conviction of the management as well as the best engineers and mechanical men employed at the plant. Now, however, they find by making some slight changes in design, certain pattern difficulties can be overcome, so that these jobs can be fitted for a jar ramming machine, the molds made in dry sand instead of green sand, and eliminate fully 75 per cent. of the molders' skill. The last time I saw the head of this firm, he informed me that he felt sure the plan above outlined would work and that the saving in labor cost would soon pay for the outlay in equipment, but, best of all, he said: "The fear of a molders' strike in our foundry has had the stinger taken out."

The molding machine and the handyman molder have made possible the open shop in the foundry. To some of you the economies that have been effected would be astonishing. I base this statement on what I know regarding conditions in the large number of foundries which have successfully combated strikes and established open shops. Much of this information regarding output and costs is given me in the strictest confidence, and consequently I am not at liberty to tell you some things which I believe would be of interest.

The open shop foundry, with its freedom from restrictions on molding machines, handymen and apprentices, the rewarding of individual effort, has been much more profitable to many members of this association than they are willing to publicly admit. That some are more successful than others in getting results is true in this as in all other lines of human endeavor.

The rule of some successful shops to put in any machine, flasks or rigging which will effect economies sufficient to pay for the outlay in a year, is, I believe, sound reasoning. As one foundryman put it: "Even if my profits have not been increased at the end of the year, the machines, flasks, &c., have some value as scrap iron, which otherwise would have been absorbed in labor costs, and in addition I have been able to conduct my business without the highly skilled molders that would otherwise be required." Then, too, he is playing safe in not losing orders because of inability to get workmen to fill his shop.

The experience of the past year has brought home to your officers the fact (which has been emphasized in previous reports) that too often the foundry is neglected, and it is not until labor troubles are threatened or actually occur that anything like a careful analysis is made and steps are taken to improve the equipment or methods.

Reports of the Treasurer and Secretary

The report submitted in behalf of the treasurer, the People's State Bank, Detroit, showed the finances of the association to be in most satisfactory shape.

F. W. Hutchings, secretary, reported a total membership of 492 foundry plants, a net gain having been made the past year of 25 plants. In addition, the Administrative Council acted favorably on three applications for membership during this convention, as follows: Cadillac Motor Car Company, Detroit, Mich.; Great Western Mfg. Company, Leavenworth, Kan.; Lincoln Iron Works, Rutland, Vt. Four more applications are pending.

Marshall Cushing, legislative representative of the association at Washington, presented a most interesting and comprehensive report on the legislative and political record of the past year. He dwelt specially on four features, as having most significance. One is the beginning of eight-hour legislation; another, the effort made by President Taft to secure anti-injunction legislation; third, the defeat of the so-called Hughes amendment to nullify, in the case of organizations of laboring men, the provisions of the Sherman anti-trust act, so that boycotting would be permitted; fourth, the overwhelming change in the political complexion of the House of Representatives at Washington. He stated that "any one who has advocated the employment of educational methods in the treatment of the labor question now finds himself justified as never before in going to the fullest extreme in pressing such an urgent need upon the attention of manufacturers and employers generally."

WEDNESDAY AFTERNOON SESSION

The report of the Committee of Investigation of Liability of Employers for Industrial Accidents was read by Thomas E. Durban, Erie City Iron Works, Erie, Pa. It favored the enactment of legislation in which the interests of both workmen and employers shall be properly safeguarded, but the committee was not yet prepared to make specific recommendations, except that it was held to be extremely desirable that the legislation by the different States should be uniform.

The discussion which followed was exceedingly interesting. The first three speakers took up the legal aspects of the question. They were H. V. Mercer, attorney and chairman of the Minnesota State Employers' Liability Commission; Judge Paul D. Carpenter, Manufacturers' Association of Milwaukee; George F. Monoghan, Detroit, attorney for the National Founders' Association. Among those who spoke as employers were H. I. Shepherd, Toledo Shipbuilding Company, Toledo, Ohio; Thomas Devlin, Philadelphia; C. A. Chase, Syracuse Chilled Plow Company, Syracuse, N. Y.; G. E. Emmons, General Electric Company, Schenectady, N. Y., and E. L. Dawes, Standard

Sanitary Mfg. Company, Pittsburgh, Pa. Many important points were brought out in this discussion, which will doubtless be of great use in handling the subject before State commissions and legislative committees. It was exceedingly interesting to note the spirit of kindliness toward employees, the desire to extend to them fair treatment and the general disposition to treat them as liberally as possible shown by the employers throughout this discussion. The report was approved and the committee continued.

THURSDAY MORNING SESSION

Prof. Herman Schneider, University of Cincinnati, reviewed the evolution of the continuation school. This work was inaugurated by the University of Cincinnati, which established a six-year course for engineering students, arranged so that they could spend alternate weeks in theoretical study and practical commercial work. This plan has since been adopted in the high schools of Cincinnati and has proved so successful that manufacturers and other employers have found it profitable to pay full time wages to boys who spend half their time in school. Under this system of education their efficiency is increased to a degree that enables them to do more work in half their time than is usually performed by boys who do not have the advantage of this course of practical education.

The latest development of the Cincinnati system is the continuation school for foremen and mature mechanics. This is a night school and has become very popular.

Prof. J. J. Flather, University of Minnesota, read a paper on the "Education and Development of the Apprentice," in which he reviewed the several plans of continuation schools, manual training schools and student-apprentice systems, and outlined a method of industrial education which he recommends.

The Winona Technical Institute

C. A. Bookwalter, Indianapolis, made an interesting talk on the subject of the Winona Technical Institute. He has recently been appointed receiver for this school and its property, owing to financial difficulties which had overtaken it. He is engaged in working out a plan to have the institute taken over by the public school authorities of Indianapolis. Before this can be done it will be necessary to get a bill through the Legislature which will authorize a school tax levy for an educational institution of this character. The property held by the institute has proved a very fortunate investment. The ground cost originally less than $200,000 and is now valued at $1,000,000, and Mr. Bookwalter as receiver expects to issue bonds which will take up the present indebtedness. The necessary legislation and other legal steps in transferring it to the school authorities will require more than a year to carry them out and meantime the school will be dependent upon private support.

One object in view in making the school a part of the educational facilities of the city is to make it more popular with boys and overcome the caste feeling which interferes with industrial education. When manual training schools were first established in Indianapolis this caste feeling proved a serious obstacle, but it was slowly overcome, and the manual training high schools are now more popular with boys than the old classical schools. The Winona Institute, however, continues to suffer from this caste feeling on account of its private character, as many boys or their families look upon it as a "charity enterprise." When it becomes a recognized part of the public school system this feeling will undoubtedly disappear.

The school has proved very successful in its practical work. The foundry, operated under the able direction of Prof. E. A. Johnson, does a large amount of commercial work, and many of the boys are able to pay their tuition and all expenses, so that they do not require outside support. In some cases the international labor unions have interfered with the efforts of the school to do commercial work, especially in the printing school.

Against Shortening the Working Day

F. C. Caldwell, H. W. Caldwell & Son Company, Chicago, submitted the following resolution, which was approved by the Committee on Resolutions and unanimously adopted by the convention:

Resolved, That this association is opposed to any reduction in the hours of working below those now established, because we believe such reduction would be harmful to both manufacturer and consumer.

It is our opinion that the existing hours of labor, at least in our own industry, are not excessive, viewed with reference either to the physical capacity of the workman or his social, moral and intellectual welfare. The actual physical exertion required from the shop workman has been in the last few years greatly reduced by the general introduction of labor saving appliances in every department of the shops, and this condition is rapidly increasing.

The present capacity of the plants in our industry is no more than adequate to supply the demand under normal business conditions and to maintain that capacity with a shorter workday would make necessary additions to plants and equipment, with the consequent added interest charges and overhead burden. The increased cost of manufacture, due to the greater capital investment, added to the higher labor cost resulting from the payment of fair living wages for the shorter workday, must increase the cost and selling price of our products and this increase must ultimately be borne by the consumer.

We point out to the public generally, including, of course, workingmen in every industry, that the greater cost of manufacture, due to shorter working hours and other restrictions of production, is a direct and important, though often overlooked, factor in increasing the cost of living.

We further wish to record our definite opinion that the movement of the labor unions for a shorter workday, restriction of output, and higher wage is directly responsible for higher cost of production and consequently higher cost of living.

THURSDAY AFTERNOON SESSION

P. W. Gates, Hanna Engineering Works, Chicago, second president of the association, was requested by President Briggs to take the chair. Henry A. Carpenter, chairman of the Nominating Committee, reported that Vice-President Charles M. Jarvis, American Hardware Corporation, New Britain, Conn., owing to the death of Philip Corbin, would not be able to give the necessary attention to the affairs of the association, and, therefore, requested that his name should not be considered in connection with any official position. The list of officers as recommended by the committee and unanimously elected by the association is as follows:

President, O. P. Briggs, Minneapolis, Minn.; vice-president, Henry D. Miles, Buffalo Foundry & Machine Company, Buffalo, N. Y.; secretary, F. W. Hutchings, Detroit, Mich., treasurer, Peoples State Bank, Detroit.

DISTRICT COMMITTEES.

First District.—F. D. Wanning, Birmingham Iron Foundry, Derby, Conn.; E. A. Jones, E. D. Jones & Sons Company, Pittsfield, Mass.; Henry B. Sargent, Sargent & Co., New Haven, Conn.; Thos. W. Fry, Sullivan Machinery Company, Claremont, N. H.; D. K. Bartlett, Builders' Iron Foundry, Providence, R. I.

Second District.—G. H. Johnson, Isaac G. Johnson & Co., Spuyten Duyvil, N. Y.; S. L. Moore, Moore Brothers Company, Elizabeth, N. J.; F. E. Wheeler, International Heater Company, Utica, N. Y.; C. A. Chase, Syracuse Chilled Plow Company, Syracuse, N. Y.; E. S. Dean, United States Radiator Corporation, Geneva, N. Y.

Third District.—J. H. Schwacke, William Sellers & Co., Inc., Philadelphia, Pa.; Chas. J. Mesta, Mesta Machine Company, Pittsburgh, Pa.; Thomas Shipley, York Mfg. Company, York, Pa.; W. R. McClave, McClave-Brooks Company, Scranton, Pa.; Alex Jarecki, Jarecki Mfg. Company, Erie, Pa.

Fourth District.—R. H. Jeffrey, Jeffrey Mfg. Company, Columbus, Ohio; William Gilbert, Buckeye Foundry Company, Cincinnati, Ohio; H. J. Boggis, Taylor & Boggis Foundry Company, Cleveland, Ohio; C. H. Gifford, American Blower Company, Detroit, Mich.; E. B. Perry, Industrial Works, Bay City, Mich.

Fifth District.—F. C. Caldwell, H. W. Caldwell & Son Company, Chicago, Ill.; H. T. Hornsby, United Iron Works Company, Springfield, Mo.; H. R. Robinson, Robinson &

Co., Richmond, Ind.; J. H. Steedman, Curtis & Co. Mfg. Company., St. Louis, Mo.; H. Ainsworth, Williams, White & Co., Moline, Ill.

Sixth District.—Otto H. Falk, Falk Company, Milwaukee, Wis.; Oliver Crosby, American Hoist & Derrick Company, St. Paul, Minn.; Theo. O. Vilter, Vilter Mfg. Company, Milwaukee, Wis.; J. L. Record, Minneapolis Steel & Machinery Company, Minneapolis, Minn.; Frederick Robinson, J. I. Case Threshing Machine Company, Racine, Wis.

Seventh District.—J. A. Milne, Allis-Chalmers-Bullock, Ltd., Montreal, Que.; L. L. Anthes, Anthes Foundry Company, Ltd., Toronto, Ont.; C. H. Waterous, Waterous Engine Works Company, Brentford, Ont.; J. A. Kilpatrick, Canada Iron Corporation, Ltd., Hamilton, Ont.; Geo. W. Watts, Canada Foundry Company, Ltd., Toronto, Ont.

Eighth District.—W. D. Tynes, Hardie-Tynes Mfg. Company, Birmingham, Ala.; W. E. McClamroch, Southern Engine & Boiler Works, Jackson, Tenn.; G. T. Thayer, South Side Foundry & Machine Works, Charleston, W. Va.; W. S. Mosher, Mosher Mfg. Company, Dallas, Texas; W. J. Oliver, Wm. J. Oliver Mfg. Company, Knoxville, Tenn.

It is understood that the new Administrative Council will reappoint the commissioner, A. E. McClintock, Detroit.

On being escorted to the chair President Briggs made a brief address, congratulating the members of the association that at present they were hearing no talk of strikes or labor troubles, but would be able to give their attention to constructive work in the improvement of their relations as employers with their employees. The convention was declared adjourned.

THE BANQUET

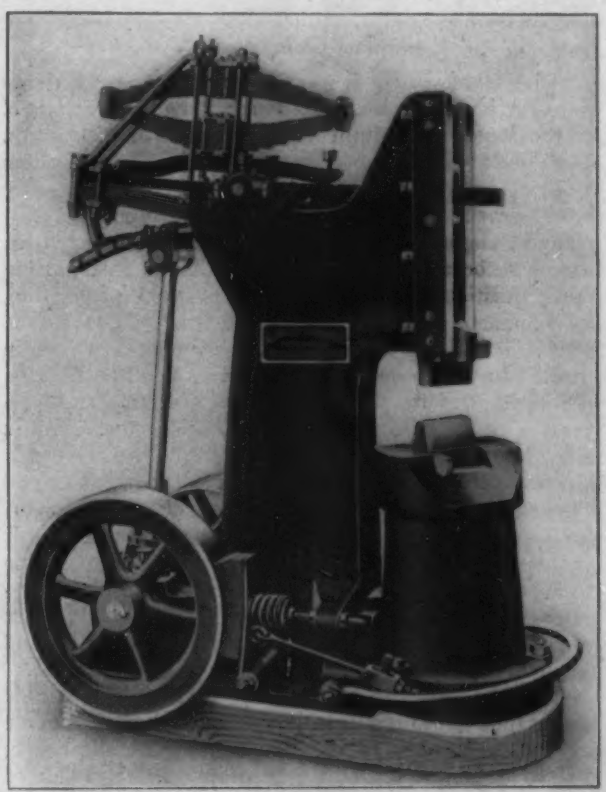
The annual banquet on Wednesday evening, which was held in the Hotel La Salle, proved in every way fully equal to previous functions of this kind enjoyed by the members of the association. It was a Minnesota evening, befitting the occupancy of the presidential office by a Minnesota man. The speakers were Dr. Cyrus Northrop, president of the University of Minnesota, and two Minnesota members of Congress, Frederick C. Stevens and Frank M. Nye of St. Paul and Minneapolis, respectively. The addresses were scholarly, instructive and inspiring. George F. Steedman, St. Louis, who was toastmaster, filled the duties of that exacting position most admirably.

The Alinder Power Hammer

Endeavors have been made in recent years to improve the power hammer and make it more effective, extending its field farther into that of the more expensive steam hammer. In the Alinder hammer, which is being marketed by the Reliance Engineering & Equipment Company, Milwaukee, Wis., it is claimed that a machine has been produced that will meet all the demands usually made on a power hammer. Its points of special excellence are that the ram comes down against the die in all positions which does away with the necessity for making adjustments while the hammer is in use, the adjustment for different strokes can be quickly made, increasing the force of the hammer blow due to the spring arrangement, small power consumption, supporting the ram on a heavy steel arm and having long guides, a heavy flywheel and locating the pulleys and flywheel at the base of the machine which does not disturb the stability of the hammer. This hammer is adaptable for all kinds of forgings, and it is said that its sensitive adjustment and the firm, powerful, quick elastic blow it strikes will allow even hard weldings to be made with it.

The main feature of the machine is the spring arrangement which is patented. The arm carrying the hammer head or ram is made in two parts, and is pivoted to the frame in the center. This arrangement makes it possible for the arm to adjust itself automatically for widely varying thicknesses of stock without the necessity of any adjustment by hand and without lessening the force of the blow. The arrangement is one which, it is claimed, is not possessed by any other spring hammer. Another result of this construction is that the blow is many times heavier than the weight of the ram. This is caused by the compression of the upper spring, which will store the energy it receives from the momentum of the ram and give it back to the ram at the next blow. The momentum of the ram is produced by the speed of the hammer, which causes the ram to continue going upward after the connecting rod has passed its lowest point and started on the up stroke; forming an angle on the upper side of less than 180 degrees between the two parts of the carrying arm and thereby compressing the upper spring.

The adjustment of the stroke is made by moving the cross head, to which the upper end of the connecting rod is fastened, either in or out on the cross head



A New Type of Power Hammer Sold by the Reliance Engineering & Equipment Company, Milwaukee, Wis.

guide, but on account of the spring arrangement it has been found that no adjustment is necessary except in a very few special cases.

The hammer head or ram is made of cast steel, and runs in long adjustable guides. The ram is carried by a heavy, tempered steel arm. This hammer has no sensitive or weak springs, rubber cushions, leather straps, links or rollers or the numerous other wearing parts ordinarily used for transmitting power to the ram.

The frame is cast in one piece, with an independent anvil guided by the frame, but in such a way as not to transfer any shocks to the frame. The anvil is formed at the bottom with a large base. The pulleys and the flywheel are placed at the floor so as not to disturb the stability of the hammer. The simple construction of the hammer makes it possible to bring the loss from friction down to a minimum and thereby effect a saving in wear and repairs.

Around the base is the treadle or foot lever by which the hammer is started and stopped. The speed and the force of the blow is regulated by this same lever by varying the foot pressure on it. A brake, clearly shown in the engraving, connected with the foot treadle, acts on the flywheel as soon as the foot is removed from the treadle, instantly stopping the hammer.

Lake Superior Iron Mines

MARQUETTE, MICH., November 19, 1910.—The State of Minnesota will realize a good sized sum of money this year in the way of royalties on iron ore taken from lands owned by the commonwealth and which have been leased to mining operators. The output of these properties will approximate 1,200,000 tons. The revenue to the State from this particular source will steadily increase the next few years. A very large acreage of mineral lands has been leased to various concerns and individuals, and there is little doubt that its exploration will result in the development of other shipping mines. A number of deposits of ore that already have been found are, in fact, being held in reserve at the present time, the holders being content to pay the minimum royalty until it suits their convenience to begin mining operations.

The Grant Mine

One state-owned property which is being actively wrought is the Grant mine, which is under the control of the Jones & Laughlin Steel Company of Pittsburgh. The Grant is the property at which the clamshell system of stripping was given a prolonged and costly test, only to be discarded in favor of the steam shovel method generally in vogue on the Mesaba. Much of the overburden has now been removed and the mine is fast getting into condition where it can make a larger production, its shipments recently having averaged 30,000 tons a week. Aside from the Grant, the Jones & Laughlin Steel Company controls a number of other Mesaba properties, among them the Lincoln, Leetonia, Longyear, Fowler, Meadow, Nassau and Hector. It has large holdings on the Marquette range, also, and it is interested to some extent in theGogebic, Menominee and Cuyuna districts. Its shipments from the Lake Superior region will not fall far under 2,000,000 tons this year, 1,500,000 tons of this from the Mesaba, aside from which it has made purchases from other companies. The Jones & Laughlin underground mines will all be wrought actively throughout the winter, and no small volume of open pit work will be conducted.

What promises to be a mining field of considerable importance is the territory in the vicinity of Pokegame lake, at the extreme western end of the Mesaba range. Ore in large quantities has been found as a result of drilling operations conducted the past few years, and it it not improbable that the coming year will see development work in progress. Tests preliminary to activity of that nature are, in fact, now being conducted by M. A. Hanna & Co., of Cleveland. The Hanna interests control the Poole property. Ore has been located in this tract, but it lies so close to the lake, if actually it does not dip under the Pokegame basin itself, that its mining may prove something of a problem, the conditions being somewhat similar to those at the Syracuse mine, in the Lake Embarrass region, at the eastern end of the Mesaba, where, after a very large expenditure of money and several years of time, the work of opening the property was abandoned a few months ago because of the remarkably heavy inflow of water. To determine not only the seepage from the lake, but the exact character of the overburden and of the ore itself, the Hanna Company is putting down test pits. On the outcome will depend the character of the proposed development work.

New Mesaba Shippers

The United States Steel Corporation, which is opening a gigantic open pit mine at that point, will carry on very extensive operations at the Hill property at Marble, western Mesaba range, during the winter. The Hill is one of the so-called Great Northern tracts taken over by the Steel Corporation. It contains many million tons of ore and for two or three decades to come it will be one of the very heaviest shippers in the Lake Superior country. The open pit already has attained extensive proportions and by next summer much more of the overburden will have been removed. The stripping work is being pushed vigorously. Another new mine on the Mesaba, but one of comparatively small importance, is to be opened in the Chisholm district by a pool of Minnesota men. The property has been named the Jackpot. The ore deposit contains probably somewhat in excess of 500,000 tons and is to be taken out by the underground system. It is expected to begin shipping the latter part of next season.

Most of the principal Mesaba towns will be connected by a trolley line within the next two years, providing the plans of the Mesaba Electric Railway Company are carried out as now projected. A franchise authorizing the establishment of the system has been granted by the St. Louis county commissioners. The line will extend from Stevenson to Gilbert, as at present planned, and with its various branches will have a total length of 50 miles.

The Swanzey District

In the belief that the northwestern extension of the Swanzey iron bearing formation penetrates the territory, a considerable acreage of government land in the Flat Rock country south of Ishpeming, Marquette range, has been filed upon latterly, under the homestead laws of the United States. It is in the Swanzey field that the Cleveland-Cliffs Iron Company has made some of its most important discoveries of ore the past few years, and where it is conducting mining and development work on a large scale. The operations of the company attracted the particular attention of the public a year or two ago, with the result that there was a rush for government homesteads and timber and stone claims in the district east and southeasterly, and entries were made covering a large acreage. This movement is now being repeated in the opposite direction. No ore other than float deposited by a glacial action centuries ago has ever been found in the Flat Rock country, and as far as indicated by the present geological maps the prospect of mines ever being opened is very dubious. The drift is heavy, which means that any exploration which may be conducted will be difficult and expensive. It may be that a tongue of the ore bearing strata extends into the district, but if so the soil and the rock characteristics are lacking or else they escaped attention when the geologists mapped out the district years ago. Some of the land is capable of being converted into fairly good farms, but for the most part the acreage is of little value, the bare possibility of mineral wealth excepted.

As was expected, denial is made that there is in progress of negotiation any deal by which the Lake Superior mining interests of Corrigan, McKinney & Co. of Cleveland would be transferred to the United States Steel Corporation. The Steel Corporation is not contemplating any immediate expansion of its holdings in the Lake Superior country, nor does it appear that Corrigan, McKinney & Co. have any intention of retiring from the mining business.

Cuyuna Range Railroad Connection

After having been in course of construction for a year or more, the Cuyuna Range division of the Soo Line is now going into commission. Trains will be run from Crosby to Duluth, passing through the towns of Moose Lake, Aitkin and Deerwood. It is over this division that all the ore from the Cuyuna Range mines now being opened will be transported to Lake Superior, unless the Northern Pacific, which serves a portion of the territory, should decide to reach out for a share of the traffic, and this freight service will be started next spring or when the ore dock now being built on Allouez Bay is ready for duty.

According to information from Ely, Vermilion

Range, an excellent showing is being made at the old Chandler mine, formerly operated by the Steel Corporation, and which is now in the hands of a company composed of Minnesota men. An ore body, apparently of large extent, has been found, and it is being developed, and it is said that by next spring the property will be in condition to produce at the rate of 500 tons daily. The ore is of high grade.

Texas Iron Ore in Eastern Pennsylvania

Dr. William B. Phillips, chief of the Bureau of Economic Geology, University of Texas, has prepared the following on the iron ore situation in East Texas:

On June 15, 1910, the first coastwise shipment of east Texas iron ore left Texas City for Philadelphia. It consisted of 568 tons and came from Cass county, on the line of the Jefferson & Northwestern Railway. The shipment was a test lot to be tried in a Pennsylvania blast furnace and was not intended as the immediate precursor of other and larger shipments. The results of the test were so favorable that contracts involving 1000 tons of ore a day can now be placed in eastern Pennsylvania. The Texas Iron & Coal Company, with a capital stock of $3,000,000, has been organized by New York, Philadelphia and Texas people and a permit to transact business in Texas will shortly be applied for. This company has acquired 52,000 acres of iron ore lands in east Texas and proposes to engage in the business of mining and shipping iron ore on a large scale.

There are two outlets for this ore, disregarding such shipments as may go by rail to St. Louis or to the Birmingham district in Alabama. These are from the ore fields by rail to some Gulf port, Port Arthur, Beaumont (later), Bolivar or Texas City, and from the ore fields to some point on the Mississippi River, such as Vicksburg or Baton Rouge. It depends to a large degree upon the railroads contiguous to the ore districts whether this ore will go out through a Texas port or down the Mississippi River in steamers by way of New Orleans. If the railroads will give a rate of $1 a ton to tidewater, it is likely that the greater part of the ore will go out from some Texas Gulf port. If they will not do this, it is likely that the traffic will be diverted from the Texas Gulf ports and seek an outlet by way of the Mississippi River and New Orleans. The traffic will not stand a higher rate than $1 a ton to tidewater, for the ore must be laid down at Atlantic ports at a total cost not to exceed $3 a ton.

The railroad haul to tidewater does not exceed 325 miles and a rate of $1 a ton means 0.3 cent per ton mile. In the Birmingham district, Alabama, such traffic has been handled for 0.25 cent per ton mile for distances of 100 miles. Applied to our own conditions this would mean a rate of 75 cents a ton for a haul of 300 miles, so that it would appear reasonable to expect a rate of $1 a ton. The rate to St. Louis, 541 miles, is $2 a ton. Shipments have been made to Birmingham, 512 miles, for $2.20.

There is a very large tonnage of iron ore to be moved in the one direction or the other. The 300,000 tons a year can easily be increased to 1,000,000 tons a year, for the ore fields are practically inexhaustible. Unloading and loading facilities are nearing completion at Texas City, and about $250,000 has already been expended there for the rapid handling of such ore as will naturally seek that outlet. The development of the east Texas iron ore fields will certainly go forward, and if our roads want the business they must establish a rate that will secure it.

The annual meeting of the Society of Automobile Engineers will be held in New York, January 11 and 12. A number of technical questions will be discussed and reports will be made by the society's Committee on Standards, including the divisions on plain, ball and roller bearings and on aluminum and copper alloys.

The Cleveland Portable Arbor Press Stand

It is frequently desirable in machine shops to have an arbor press located near where work is being done, and in a number of cases the press cannot be mounted on a bench conveniently or a stationary stand used. To meet these conditions in shops where only one or two of these tools are required the Cleveland Machine Specialty Company, Cleveland, Ohio, has placed on the

A Portable Stand for Arbor Presses Made by the Cleveland Machine Specialty Company, Cleveland, Ohio.

market the portable stand illustrated herewith, which is designed to accommodate its Nos. 5 and 6 arbors presses. The former was illustrated in *The Iron Age* September 29, 1910.

As will be noticed from the engraving, the stand is of box construction. The back is open, and three internal ribs in the column supply shelf room for arbors, broaches, collars and other special fixtures which have to be kept with the machine and moved about from place to place with it. The depth of throat in the stand is 10 in., which is the same as the company's No. 5 press, thus giving a clearance under the bed of the press for work 20 in. in diameter or less.

When the arbors are expelled from the work they fall into a pot with a lead lined bottom, which prevents the arbors from being injured. This pot is easily removable from the base. If desired the stand can be furnished without a truck and used as a stationary one. The weight of the stand alone is 450 lb., and with the manufacturer's No. 5 press, as illustrated, 880 lb. The floor space occupied is 24 x 41 in.

The Morehead Condenser Trap

A New Device for Draining Heating Returns Automatically

For draining exhaust steam and reduced pressure heating systems of both air and water and at the same time producing a vacuum which will insure positive and rapid circulation, the Morehead Mfg. Company, Detroit, Mich., has invented and placed on the market the device illustrated herewith. It is known as the Morehead condenser trap, and in general appearance is similar to the return steam trap of its maker. In detail, however, the two differ, as the former has a cold water connection with the tank of the trap which is made through a flexible tube, both being clearly shown in Fig. 1. The flexible connection terminates in a perforated pipe running the entire length of the trap tank, so that the trap may be considered as a combination of the principles of the jet condenser with those of the maker's automatic return steam trap.

When the condenser trap is connected to the return line of a vacuum heating system where a difference of pressure is maintained between the ends of the system it draws the line condensation and the accumulating air into the tank with more power than the ordinary return trap because of the vacuum created therein. In operation the cold water supply valve is opened slightly when the steam is turned on in the various lines of the heating system which are full of cold

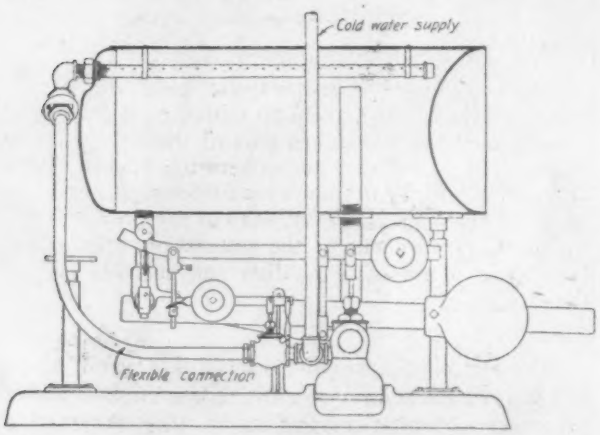


Fig. 1.—View Showing Construction and Condensing Apparatus of the New Trap Made by the Morehead Mfg. Company, Detroit, Mich.

air. When the tank is filled by the condensation from the returns and the condensing water, it tilts, which opens the live steam valve, thus allowing steam to enter and discharge the contents by its pressure into a return steam trap above the boiler or into an open heater. As soon as the tank empties, it resumes a horizontal or filling position, and this movement automatically opens the control valve on the cold water inlet and the cold water comes in contact with the steam in the tank, condensing it and producing a vacuum. The cold water supply may be taken from any available source, and it is claimed that very little is required. A receiver is always used in connection with the condenser trap, the water seal in the former taking the place of the thermostatic valves in the heating system. The condenser trap is used as a lower trap, taking the place of the return trap in a standard double trap installation and discharging into the return trap above the boiler.

There is a typical installation of the trap at the E. M. F. Motor Car Company, Port Huron, Mich. This plant is a two-story brick building, with numerous large windows and electricity supplied from an outside source is used for power. A special 125-hp. boiler was installed for heating purposes, and the condenser trap, shown in Fig. 2, which is located on the boiler room

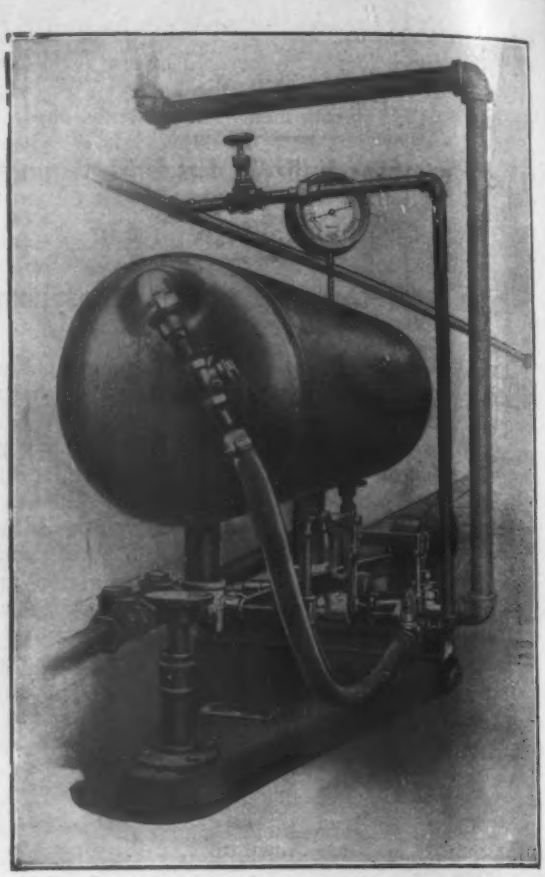


Fig. 2.—One of Two Traps Installed at the Plant of the E. M. F. Motor Car Company, Port Huron, Mich.

floor alongside the boiler, discharges the water of condensation into the steam trap on top of the boiler, which is illustrated in Fig. 3. The return lines and the condenser trap are connected by a receiver located about 5 ft. below the boiler room floor. The piping system, which is equivalent to 60,000 ft. of 1-in. pipe, is so arranged that the wall coils in the factory, and the cast iron radiators in the office are all fed from above, while the returns are run along the first floor with no fall until just before entering the boiler room. Here all the returns are gathered in one 3-in. pipe, which carries the condensation to the receiver. From the receiver the water is carried to the condenser trap and lifted from there to the return trap on top of the boiler, a distance of 15 ft., and discharged into the boiler. The pressure at the boiler is between 25 and 40 lb.,

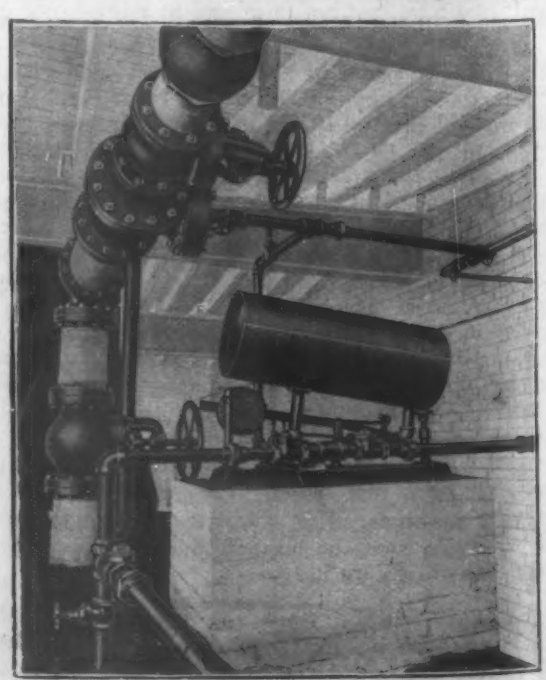


Fig. 3.—Return Trap on Top of Boiler Tilted for Discharging.

and is reduced to 1¼ lb. in the system which produces a vacuum of 25 in. in the trap tank. In a test of this plant made in zero weather, the heating plant was operated for 23 consecutive hours on 3 tons of coal.

The New Marshall & Huschart Building

The new building of the Marshall & Huschart Machinery Company, at 17 South Jefferson street, Chicago, was formally opened on the evening of November 19. Invitations were issued to machine tool buyers and the experts of large tool using industries in the West, as well as to manufacturers whose product is represented in the "demonstration room," and met with a hearty response. Nearly 200 machine tool men assembled to take part in the occasion. A light buffet lunch was served, and addresses were made by several of the visiting manufacturers.

The building occupies a plot 80 x 160 ft., and has light on all sides. It is three stories and basement, of combination steel and mill construction, with a front of plate glass and white enamel brick. The demonstration room occupies the greater part of the main floor, providing ample space for belt driven tools, as well as those driven by individual motors. The leading manufacturers in attendance expressed the opinion that this new building is the best equipped for the display of machine tools of any establishment in the United States, if not in the world.

The principal machines that were demonstrated during the evening were a Bullard vertical turret lathe, Cincinnati high power miller, Lodge & Shipley high-speed lathe, Gould & Eberhardt gear hobber and gear cutter, Cincinnati planer, Bickford new type radial drill, Cincinnati high-speed shaft driven drill, Gould & Eberhardt high duty shaper, Landis high-speed bolt cutter and Rockford automatic manufacturers' drill. These machines were all put through their paces by factory experts, whose work was watched with the keenest interest.

As an introduction to the demonstration of these machines, President Marshall of the Marshall & Huschart Machinery Company invited the guests to be seated and hear a few words from manufacturers present. The first speaker introduced was Fred L. Eberhardt, Gould & Eberhardt, Newark, N. J., who made a technical talk on gear cutting. He discussed with the guests of the evening in a very frank manner the advantages and limitations of gear hobbers, giving the result of eight years of experimental work which his company has carried on. E. P. Bullard, Jr., Bullard Machine Tool Company, Bridgeport, Conn., discussed the question of shop efficiency. He took for his text the maxim, "The best way of cutting costs of production is to cut the time between cuts." From this point of view he discussed the value of time saving devices and improvements which enable the workman to handle his machine with greater ease and speed, thus increasing the rate of production. Brief addresses were also made by W. H. Shafer, Cincinnati-Bickford Tool Company, and Charles S. Gingrich, Cincinnati Milling Machine Company.

Other manufacturers present were: A. H. Tuechter and Sherman C. Schauer, Cincinnati-Bickford Tool Company; S. H. Reck and Robert Milne, Rockford Drilling Machine Company, Rockford, Ill.; P. O. Geier, Cincinnati Milling Machine Company; N. Chard, Lodge & Shipley Machine Tool Company, Cincinnati, and C. Meiers, Cincinnati Planer Company. Among the visiting dealers were Herr Schuette of the A. H. Schuette Company, Cologne, Germany, and M. Buehling, Paris, France.

Anti-Accident Boards Advocated.—Thomas D. West delivered an address Saturday evening, November 19, before the Cleveland Superintendents' and Foremen's Club, allied with the Cleveland branch of the National Metal Trades Association, dealing with the general subject of accident liability and accident prevention. He advocated the establishment of municipal anti-accident boards, to be created and managed after the manner of boards of health, but with the special function of safeguarding life and limb in industrial and commercial operations. The club decided to appoint a committee to draw up resolutions to be presented to the Ohio Employers' Liability Commission.

The Inland Steel Company's Earnings

The report of the Inland Steel Company, Chicago, Ill., for the year ending June 30, 1910, shows a large increase in net earnings. The figures for the year, with comparisons with the preceding fiscal year, are as follows:

	1909-10.	Increase over 1909.
Sales, less discount and exchange	$9,816,003	$3,498,594
Cost of sales	8,184,130	2,608,961
Net earnings	$1,631,963	$889,633
Other income	2,174	*10,319
Total income	$1,634,137	$879,314
Deduct—		
Interest	$168,750	$65,769
Dividends, 7 per cent.	404,577	404,577
Depreciation reserve	150,000	150,000
Total deductions	$723,327	$620,346
Balance surplus	$910,810	$258,968

* Decrease.

The Greater Indianapolis Industrial Association has been organized at Indianapolis, Ind., with $25,000 capital stock, and has taken an option on a large tract of land in the southwestern part of the city, where it is proposed to found a manufacturing suburb. The association will try to induce manufacturing companies to locate there. J. N. Carey, head of the Stewart Drug Company, is president of the association, other members being prominent capitalists and business men of the city.

The Detroit Shipbuilding Company, Detroit, Mich., has secured the contract for the construction of a steel passenger excursion steamer 240 ft. long, 60 ft. wide, to be built for Ashley & Dustin, Detroit, to cost $275,000. The steamer will be built from plans of Frank E. Kirby, naval engineer, Detroit.

The Hinckley Construction Company, 805 D. S. Morgan Building, Buffalo, N. Y., has been incorporated, to deal in iron, copper, tin and all other metals. The directors are Eugene L. Falk, Edward C. Schlenker, Jay C. King, Lynn Bentley, E. L. Marshall and M. E. Robinson.

On November 11 the two blast furnaces of the Lake Superior Corporation, Sault Ste. Marie, Ont., made a new record for that plant, turning out 680 tons of Bessemer pig iron. The average for the previous month was 652 tons a day.

The Foote-Burt Company, Cleveland, Ohio, maker of drilling machines, has opened a branch sales office in Detroit, Mich., at 827 Ford Building. Howard C. Rose is manager of the office.

The Cleveland, Ohio, office of the Waterbury Farrel Foundry & Machine Company reports the receipt of an order during the week for a 24 x 72 in. hot copper rolling mill for rolling copper sheets.

The Van Norman No. 3 Miller

A New Duplex Machine of the Constant Speed Type

A new milling machine has been placed on the market by the Waltham Watch Tool Company, Springfield, Mass., which is claimed to embody a number of improvements over other types of millers. This machine is known as the No. 3 Van Norman duplex miller, and among its special features are a movable cutter head mounted on a ram or frame, which can be adjusted either in or out over the table of the machine to adapt the cutter for use in either horizontal or vertical positions or any intermediate one, a constant speed drive with gear changing mechanism within the ram for varying the spindle speeds, a gear feed mechanism, an improved box type of knee and an overhanging arm of solid steel with a tie strap mechanism to give rigidity under both horizontal and vertical cuts. Fig. 1 is a general view of the machine, Fig. 2 shows the spindle

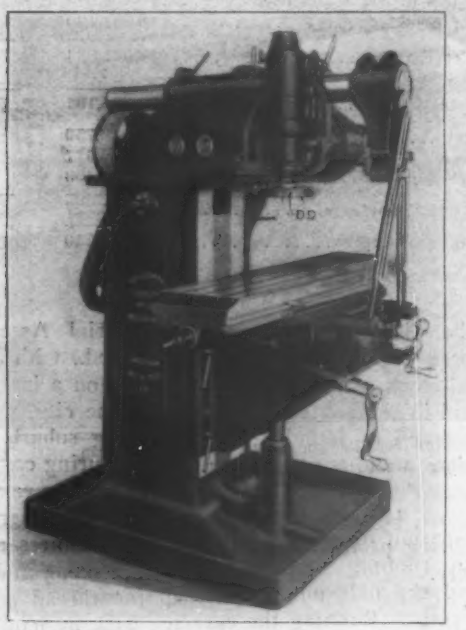


Fig. 1.—The No. 3 Van Norman Duplex Milling Machine, Made by the Waltham Watch Tool Company, Springfield, Mass.

in the horizontal position, while Figs. 3 and 4 give details of the drive and spindle speed gear changing mechanism. In all the engavings the same reference letters indicate the same parts.

The machine is solidly constructed throughout. The main head frame or ram is 35 in. long and 11½ in. wide, and its movement of 13 in. in and out of the column is controlled by the crank handle shown near the top of the column in Fig. 1. When the proper adjustment has been made, the ram is clamped in position by two lever binders. The cutter head is attached to the side of the ram, and can be moved to either horizontal or vertical position, or any intermediate one and securely clamped there.

The spindle, which is 18 in. long, has a No. 13 B. & S. taper at the front end that is adapted for reducing collets to take large split collets or tapers of other numbers. Cone bearings having a maximum diameter of 2 15-16 in. are used. Twelve spindle speeds, varying from 15 to 276 rev. per min., are provided, all of which are instantly available without stopping the machine. A chain-driven gear box furnishes 16 feed changes from 7-16 to 13 in. table feed per minute. Both of these sets of gears are of steel and run in oil.

The driving pulley A, Fig. 2, and *a*, Fig. 3, runs at a constant speed, and its splined shaft, *b*, is supported with it in the bracket *c*, which is attached to the side of the column. The bevel gears *d* and *e* connect this shaft with the one marked *f*, Figs. 3 and 4, within

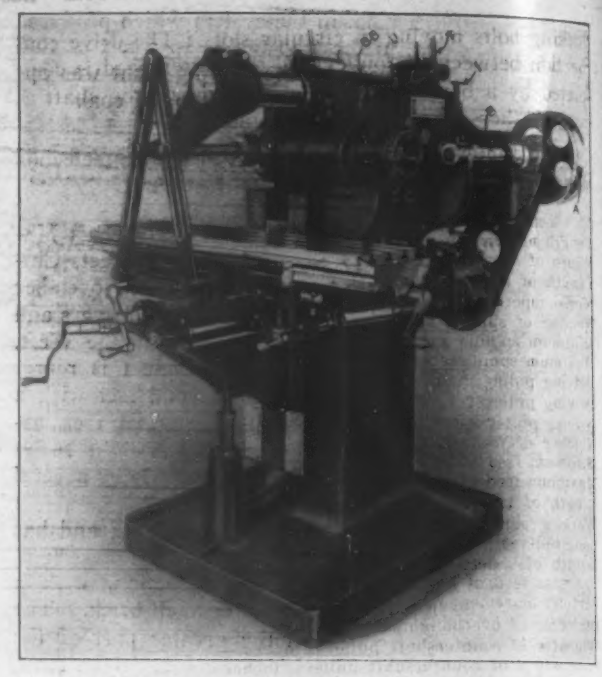


Fig. 2.—View Showing Machine with Spindle in Horizontal Position, Also General Arrangement of Feed and Drive Mechanism.

the ram. The loose clutch gear *g* is mounted on this shaft, and the combined sliding clutch and gear *h* is keyed to this shaft also, the former having its movement controlled by the lever *i*, Fig. 4. The gears *g* and *h* engage the two gears *j* and *k*, which are keyed together and revolve on the stationary shaft or stud *l*. Pivoted on this stud is the swinging frame or yoke *m*, which has a shaft or stud, *n*, that carries a sliding gear, *o*, meshing with the long gear *j*. At the upper end of this swinging frame is a spring pin mechanism, shown in Fig. 4, which locates the frame in its different positions, and the locking lever *t* clamps it securely in place. The stud *s* has a cone of gears, *p*, *q* and *r*, mounted on it, and the sliding gear *o* meshes with one of the three cone gears according to its position, which is controlled by the index lever *u* with the pinion *v*, which engages the rack on the sliding fork piece *w*. The loose clutch gears *x* and *y* on the shaft *z* mesh with the gears *p* and *r*, and the clutch *aa* is controlled by the lever *bb*. The handwheel *cc* on the end of the shaft *z* aids to bring the gears in mesh when making changes. In operating these various gears it will be noticed that *f* and *s* are shafts which revolve with their gears, while *l*, *n* and *s* are studs with freely running gears mounted thereon. The cutter head *dd*, Fig. 3, pivots on the trunnion ring *ee*, and is clamped securely in position on the face of the ram by three

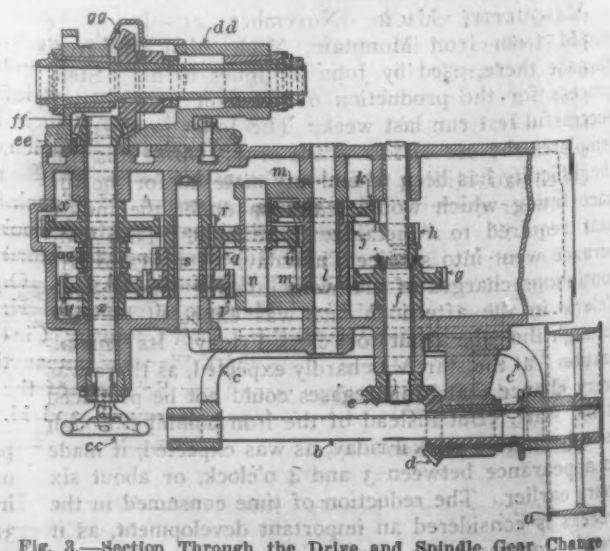


Fig. 3.—Section Through the Drive and Spindle Gear Change Mechanism.

locking bolts moving in circular slots. The drive connection between the pulley and the cutter head is completed by a bevel gear, *ff*, on the end of the shaft *s*, and another gear, *gg*, on the spindle.

The following table gives the principal dimensions and specifications of the machine:

Movement of ram, inches	13
Length of ram, inches	35
Width of ram, inches	11½
Length of spindle, inches	18
Morse taper of spindle	No. 13
Number of spindle speeds	12
Minimum spindle speed, revolutions per minute	15
Maximum spindle speed, revolutions per minute	276
Driving pulley diameter, inches	12
Driving pulley face width, inches	4¼
Driving pulley speed, revolutions per minute	300
Number of feed changes	16
Minimum feed of table, inches per minute	7/10
Maximum feed of table, inches per minute	13
Length of table, inches	48½
Working surface of table, inches	10 x 45
Longitudinal feed of table, inches	30
Length of saddle, inches	26½
Traverse feed of saddle, inches	12
Vertical movement of knee, inches	19
Diameter of overhanging arm, inches	3½
Diameter of countershaft pulleys, inches	13
Face width of countershaft pulleys, inches	4½
Speed of countershaft pulleys, revolutions per minute	300
Width of swivel vise jaws, inches	7
Depth of swivel vise jaws, inches	1½
Opening of swivel vise jaws, inches	4½
Approximate weight of machine, pounds	4,000

The regular equipment furnished with each machine consists of draw-in spindle for holding large taper shank mill mounts or arbors securely, a ⅞-in. split collet, one reducing collet with No. 7 B. & S. taper hole, a 2¾-in. end mill, one cutter arbor, one vise, a set of wrenches and a countershaft. When desired the builder is prepared to furnish at a slight additional cost, semiuniversal or full universal centers and subhead and a slotting attachment.

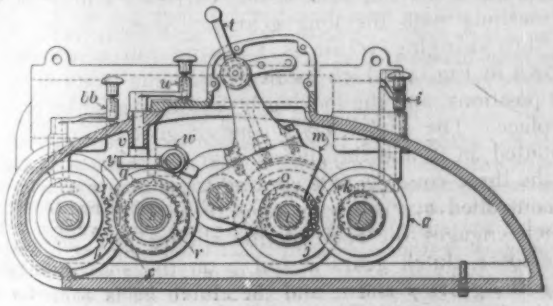


Fig. 4.—Sectional Elevation of Driving Mechanism.

The Jones "Step" Process

MARQUETTE, MICH., November 21.—It is reported from Iron Mountain, Mich., that the Ardis furnace there, used by John T. Jones in his "Step" process for the production of wrought iron, made a successful test run last week. The Jones process contemplates the use of low grade ores. Up to this time the difficulty has been to find any material for the furnace lining which would stand up under the intense heat required to "metallize" the ores. The Ardis furnace went into service Thursday. The first of the continuous charges of ore went into the tube about 1 o'clock in the afternoon and was expected to work through the tube about 10 o'clock Friday. Its "metallization" at the start was hardly expected, as there was every chance that proper gases could not be produced at the start. But instead of the iron coming through the tube at 10 o'clock Friday, as was expected, it made its appearance between 3 and 4 o'clock, or about six hours earlier. The reduction of time consumed in the process is considered an important development, as it greatly increases the productive capacity. The ore used was from the Kloman property at Republic, Mich.

It is stated by the inventor that the ore is "metallized" by the hydrocarbons contained in gas from bituminous coal, the residue in the ovens being coke. The coke is then used in the cupola, in which the product of the Ardis furnace is manufactured into muck bar. Mr. Jones is confident that with 1200 lb. of coal he can produce 1 ton of product containing 98 per cent. iron.

Lodge & Shipley Thread Indicator

The chasing dial or thread indicator as known to most mechanics is a lathe attachment for thread cutting to permit disengaging the half nut at the end of each cut, running the carriage back by hand, and reengaging the half nut to pick up the thread at the proper point. Running the carriage back by hand not only saves time, but also allows both countershaft driving pulleys to be run forward, thus giving the lathe twice as many forward speeds as would be obtained if one backing belt were used. For these reasons the Lodge & Shipley Machine Tool Company, Cincinnati, Ohio, is now furnishing a thread indicator as part of the regular equipment of every lathe. As shown in the illustration, this thread indicator, which is attached to the right of the front arm of the carriage, has several novel features.

An Indicator for Use on Lathes in Connection with Thread Cutting Made by the Lodge & Shipley Machine Tool Company, Cincinnati, Ohio.

The worm wheel of the indicator is held lightly against the lead screw by a coil spring, and can be swung back out of engagement when desired. Or, if a quantity of work which requires no threading is to be machined, the whole attachment can be quickly removed. Attached to the front of the apron close to the thread indicator is a brass instruction plate reading as follows: "Directions—For all even threads, close half-nut at any line on dial; for all odd threads, close half-nut at any numbered line; one-half threads any one-quarter revolution; one-quarter threads, any one-half revolution." Thus all necessary instructions for using the attachment, briefly stated, are continually before the operator.

The population of Trenton, N. J., is 96,815, as compared with 73,307 in 1900, an increase of 32 per cent.; of Springfield, Ohio, 46,921, against 38,253 in 1900, an increase of 22.7 per cent.; of Huntington, W. Va., 31,161, against 11,923 in 1900, an increase of 161.4 per cent.

Iron and Steel Works Labor

The Questions of Hours and of Accident Liability

The paper of Wm. B. Dickson, first vice-president of the United States Steel Corporation, read at the meeting of the American Iron and Steel Institute in New York, October 14, was printed in *The Iron Age* of October 30, page 1030, under the title, "Betterment of Labor Conditions in the Steel Industry." The discussion on Mr. Dickson's paper was participated in by Charles Kirchhoff; Edgar S. Cook, president of the Warwick Iron & Steel Company, Pottstown, Pa., and Edward Bailey, president of the Central Iron & Steel Company, Harrisburg, Pa. A revised report of their remarks is just now available for publication and we reproduce it below:

Charles Kirchhoff

Mr. Dickson's admirable presentation of some of the greatest problems not alone to the iron and steel industry, but to all the manufacturing industries of the country, has been made in an exceedingly forcible way. He has put his hand upon some of the most important points. I was struck with one statement and that was that "law is a crystallization of public opinion." In this country that is true, because we do not rely upon paternal help from above but expect improvement to come from below. That has its advantages, but it has its great drawbacks too. It means first of all that we must educate public opinion and that usually falls to the lot first of enthusiasts and only too often to the lot of demagogues. It is therefore one necessary preliminary that public opinion be educated along sound and safe lines. I have had the pleasure of being associated for a number of years with a movement aiming at improving the conditions surrounding the employment of men in works. We have found that, as Mr. Dickson has said, there was always danger of indifference on the part of manufacturers which robs them of the opportunity of influencing legislation. Legislation in this country, I am afraid, is going to take very radical directions. It is already doing so, and there is danger that it will be very much worse and that the voice of common sense will not be heard at the right time. There is a tendency already expressed in legislation to relieve the men completely of all responsibility. That tendency is even shown among those who have their interests most at heart. I think that is a grave mistake, because it goes too far; it inflicts injustice, injustice upon the manufacturer, injustice, too, upon the fellow workman. I believe that there should be some penalty, some retention of benefits from those who are reckless and above all those who break the rules which have been established for their own safety, or who mutilate or remove the appliances for safety.

In connection with this matter there is something that I believe was not alluded to because it was probably considered a minor detail by Mr. Dickson in his presentation of the splendid work the Steel Corporation is doing, and that is that they are gaining the sympathy and the interest of the men. They are doing this by trying to secure among the men themselves from time to time representatives who shall act on shop committees, and I have been told that the selection of these very men for greater intelligence and greater interest has made service on such committees a badge of honor in many of the works. That I believe, gentlemen, is the best way to get at it, rather than to make the law embrace everything, good, bad, and indifferent.

Edgar S. Cook

It is a matter of great gratification to me that the United States Steel Corporation is setting such a good example, and I am in hopes that it may lead to conservative legislation, which shall bring about the necessity of all employers expending some money in the care of their employees. At this time of very close competition, when one concern is inclined to expend considerable money in the care of employees, to have other concerns neglect it absolutely is a matter of discouragement to those who would like to help their men along from a humanitarian standpoint.

IMPROVEMENT WORK AT POTTSTOWN.

My connection with the iron business is altogether from the blast furnace standpoint. The grade of employees in the blast furnace will average lower in intelligence than in the more advanced form of manufacture, as, for instance, steel works and finishing mills. With the advent of foreign labor in the Schuylkill Valley, about 1885, gradually replacing, as it has, American labor, our conditions in regard to accidents, &c., became more and more serious. More recently, however, there has been an improvement. The difficulties of communicating with and talking to these people added very much to the troubles of the management.

When I first commenced to employ Hungarian and Slavic labor, I could not get any boarding places for them in Pottstown. We had to build shanties for their accommodation. The shanties were of a very temporary character, as we had no suitable location. We have now built what we think is a model village. It shows a vast improvement, realizing in part my hopes and wishes in the matter, and it proves that the work people are capable of advancement, if they are treated with consideration and properly instructed. Notwithstanding that the houses are furnished with bath rooms and bath tubs, and that many of them were used for all sorts of purposes except that for which they were designed, most of the people are now using them for the purpose for which they were put into the houses.

In the turmoil and the boiling of the social kettle, those that have the greatest mentality and the greatest thrift come to the top and graduate into other occupations. It is only unskilled labor that will continue to work around a blast furnace. These men are trained to do the routine work, so that while they may become semi-skilled, as it were, yet the work itself calls for little, other than so-called common labor. The fittest men, as determined by natural selection, become foremen and furnace blowers, developing occasionally into well-equipped furnace managers. Compared with the number of men employed, the positions calling for experience and skill and accompanied by attractive salaries are limited. The men, therefore, that develop industry, application and brain power, outgrow their opportunities at the furnace, seeking employment where there are better chances for advancement. These changes apparently come about entirely irrespective of the working conditions at blast furnaces, as related to the hours of work.

THIRD PARTIES IN ACCIDENT CASES.

For many years I have been in close personal contact with our men. In fact, there has been more or less of a paternal government, if a personal acquaintance and an intimate knowledge and sympathy with working conditions count for anything. Some few years ago, we realized a change of sentiment on the part of our employees, influenced no doubt by designing agents or a low grade of so-called lawyers, which resulted in threats to bring suits for all sorts of accidents. We were thus compelled to make use of employers' liability insurance policy, in order that we might be relieved from the annoyances attending settlements with third parties. I do not think that this change has proven of any particular advantage to our men, as the tendency has been to substitute compliance with laws regarding damages.

In many instances, I have no doubt, the injured employee has not fared as well, after paying fees and charges, as he did under the former regime, when each particular case was treated on its merits by our company, without the intervention of any outside agency.

BLAST FURNACE WORKING HOURS.

Considering the class or type of laborers employed at blast furnaces, I feel that a great deal of sympathy is wasted so far as the hours of work are concerned. The man who is on duty 12 hours out of 24 is not continuously employed. His labor is specialized, and his position is higher than that of the man who is working ten hours a day. In fact the latter, if at all ambitious, strives to get the job of the man who is working 12 hours. He shows a preference for working 12 hours instead of ten, for the reason that the 10-hour work is continuous hard work, and the 12 hours' work is intermittent, to say nothing of the higher dignity of a turn position. All my friends who have come in contact with the blast furnace, not from the standpoint of an office distant from the works, but from the office of the manager of the works, will understand and appreciate the facts I am stating. If these men are not working 12 hours, what are they doing? They have just enough of the beginnings of education to get together and make themselves unhappy and discontented, but with no resources to occupy their time profitably. If they are employed, they have their work to think about, although they may not do much thinking about that. At the same time, however, they are busy, without being overtaxed, either physically or nervously. I am assured that eight hours would be to their unhappiness, to our discomfort, and to the benefit of no one. An eight-hour turn would only add to the

general high cost of living, which comes from everything costing a little bit more than it ought to, without any corresponding benefit in many instances.

There are, doubtless, many forms of physical work, where the surroundings are unfavorable, or when the physical exertion is continuous and severe, accompanied by more or less nervous strain, and for these eight hours is the limit of reasonable human endurance. Conversely, there are other occupations where 12 hours' employment is to the benefit of the employee in more ways than one. During the years 1893 to 1898, when there were more men seeking employment than there was work to be performed, reducing the hours of work indiscriminately divided the work more evenly between the employed and unemployed, and by so much reduced the number of idle men. During the past decade, as a rule, there have been jobs ready and waiting for all able and willing to do a day's work.

I feel assured, from an experience extending through many years, that an eight hour work day, as applied to the average employee of the blast furnace would be to the disadvantage of the men both morally and physically. There are exceptions, of course. Certain individuals would make use of the time to their profit and advantage, but the mass would not know how to employ the four hours to their benefit in any way. In other words, they must learn to make good use of time. As they learn, they move up higher, and make room for another set of beginners. As long as there is laboring work to be done, requiring no particular skill, no brain power, but only good physique, there will be men fitted to perform such work and nothing more, except as they are trained for better things.

The blast furnace may be likened to a preparatory school, fitting boys for a college course, or business career. A wise master knows that the boys must be kept busily employed, either in recitation room, study, or play. All must be laid out according to rule, so that every hour of the 24, including the hours of sleep, has its particular duty. Lacking such an organization, the pent-up energies of the boys would concoct all sorts of mischievous schemes, working injury to themselves, and destruction to the school.

Many men never get beyond the school age, and it is necessary for their protection and advancement, that they should be surrounded by an organization that will guide them along the lines best suited for their capacities.

THE SEVEN-DAY WORK WEEK.

So far as working seven days in the week is concerned, that is a matter of comparatively easy adjustment. I do not find that our men object to blast furnace work on that account, because they can usually get a day off. They generally manage to take a day off, whether with or without the consent of the foreman. The only hardship is working 24 hours on the long turn. Under certain conditions especially, that is objectionable, but I do not see how it can be avoided. A change, however, may be brought about. Some of my friends in the charcoal furnace business have told me that in years gone by, they stopped their furnaces for 12 hours on Sunday. If we could adapt this practice to all the blast furnaces, in the present condition of business, I think it would be desirable, as it would cut down the product materially. Nevertheless, in talking to our men on the subject, the men in whom I put the most reliance and trust tell me that if we should pursue the plan of shutting down the furnace on Sunday, they would all go to farming, or some other occupation, because they know well that the stoppage would be accompanied by very hard work Monday or Tuesday. They would rather take the chance of working 24 hours every other week, than to have the shutdown.

I think there is a great improvement in our so-called foreign laborers. I have found a great deal to encourage me in my contact with them. We have had men working for us from 10 to 20 years. Their children are working for us, and they are going to make good citizens. The class who do not drink, who save their money, make good workmen, and I think will make good citizens, if we only give them a chance and surround them with the environment of a decent home.

Edward Bailey

Mr. Dickson's paper must commend itself to every thoughtful American manufacturer, whether engaged in the production of iron or steel or other products. As manufacturers I feel that we are all indebted to the Steel Corporation for what it has done toward ameliorating the conditions of its workmen. I have been asked to criticise Mr. Dickson's remarks, but I have nothing but the heartiest approval of everything he has said, from the humanitarian as well as the economical point of view. I believe that he has struck the keynote in practically everything.

Those of us who are large employers of labor realize that conditions have radically changed during the last 20 years. Mr. Cook spoke of that, in the change from American labor to what we are pleased to call foreign labor. I think we will have to get away from that idea of calling it foreign labor. It has come to stay. We can't get along without it. We could not to-day fill the orders of the manufacturing industries unless we had that labor. And it seems to me that the only way to make that labor as we would like to have it is by educating many of those men coming here. Many of them stay but two or three years. They don't speak our language, and they don't get into the spirit of our institutions. If any little accident happens, and if any money is realized, the workman gets possibly 10 or 15 or 20 per cent. of the total, whereas, if he is entitled to anything, he is entitled to it all.

Now you all know what changes have taken place in the last 10 or 15 years. The larger works have trained surgeons constantly on hand to look after their employees. Many of you know what has been done by one large concern—a large employer of labor. They have gone farther than the mere question of looking after the physical welfare of the employee in his place of work. They have employed a trained nurse, whose duty it is to visit the homes of those employees, and to see that their home conditions are satisfactory, and the man who is not using his money as he should, for the maintenance and support of his family in a proper way, that man is marked to go on the sliding board, whenever opportunity offers. Now that may be a pretty radical illustration of paternalism, but with a certain class of employees, until they are educated through the spirit of our institutions, it is a question whether some such method is more to their benefit than to our benefit.

Mr. Dickson has touched upon the subject of employers' liability. We all know the stringent laws passed in the State of New York and in the State of Ohio, with others pending in other States. I heartily approve of what he said about joining in that movement. Most of the laws as prepared to-day are by the representatives of organized labor—some of them not even organized labor. They are prepared solely from one point of view—their own point of view. They do not consider the other point of view. Now why should not we as employers join in that movement and try to advance it along scientic lines—lines that would be fair to the employer as well as to the employee? It's in the air. It is coming, and if we can shape it properly, it would be to their advantage and ours.

The Proposed Southern Iron and Steel Merger

In a recent visit to Birmingham, Ala., Cecil Grenfell, representing English bondholders of the Southern Iron & Steel Company, said that an effort would be made to bring about a consolidation of certain iron and steel companies in Alabama. Reports to this effect have been current in the iron trade for some weeks, but no definite steps have been taken. The Southern Iron & Steel Company and three blast furnace companies, all of which own considerable ore and coal properties have been mentioned. One of these companies is understood to have named a large figure and to have indicated that only a cash consideration would be entertained.

The St. Paul Machinery Mfg. Company.—The St. Paul Machinery Mfg. Company, St. Paul, Minn., recently incorporated with $450,000 capital stock, has absorbed the Dovetail Box Machine Company and the St. Paul Ditcher & Carrier Company. In addition to the wedge dovetailing machinery manufactured by the former company and the Hovland tile ditching machine manufactured by the latter company, the new company will manufacture the Hovland caterpillar plow tractor, the principles of which are the same as those used on ditching machinery, with the exception of improvements which enable the machine to turn around in its own tracks. The advantage claimed for this tractor is that it is possible to use it on wet farm lands from two weeks to two months earlier than is possible for wheel tractors. The company is contemplating the enlargement of its manufacturing facilities, but it has not been decided at this time what the additional equipment and capacity will be.

More than 1,000,000 tons of iron ore has been shipped from Bell Island mines, Newfoundland, this year by the Dominion Steel Corporation and the Nova Scotia Steel & Coal Company.

The Seneca Falls New 14-In. Lathe

New Features Include a Micrometer Cross Slide Stop

A new 14-in. quick change feed engine lathe has been brought out by the Seneca Falls Mfg. Company, 255 Water street, Seneca Falls, N. Y., which contains several new features tending toward convenient operation and accurate production of work in large quantities. These include a special type of quick change feed mechanism, a new micrometer stop for the cross slide and the reversing mechanism for the cross and longitudinal feeds and the lead screw. Fig. 1 is a general view of the lathe and Fig. 2 shows the top view of the micrometer stop.

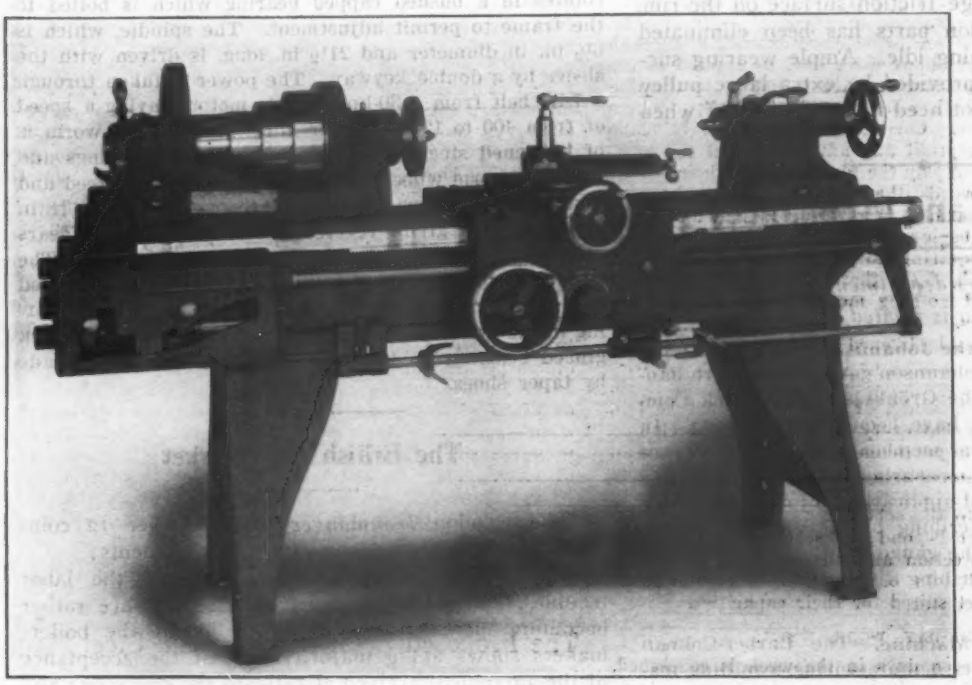


Fig. 1.—The New 14-In. Quick Change Lathe Built by the Seneca Falls Mfg. Company, Seneca Falls, N. Y.

In all 48 different rates of feed are available through the quick change feed mechanism, consisting of a cone of eight steel gears located on the lead screw (which also serves as the feed rod) at the right side of the feed cage. Gears and a tumbler yoke connect any one of this cone of gears with the lower shaft, which has three changes of speed given to it through a second tumbler and set of gears at the left end of the cage. This last set of gears has two different speeds controlled by the lever on the end of the headstock, which doubles the 24 rates provided by the eight steps of the cone of gears and the three speeds of the lower shaft, thus giving a total of 48 feeds, ranging from 0.0023 to 0.144 in. per revolution of the spindle. The settings necessary to procure any one of these feed rates, as well as cut any standard thread from 1½ to 92 per inch, are indicated on the index plate attached to the headstock, and any desired feed or thread can be conveniently and instantly obtained.

The micrometer stop for the cross slide, shown in Fig. 2, is said to be radically different from any other stop device now on the market and receives its name from the micrometer feature, which enables very fine adjustments to be made easily and quickly. A worm gear operated by a knurled head screw changes the relative positions of the stop and controls the advance of the tool, as indicated by the graduations on the micrometer barrel, which are about ⅛ in. apart and read to 0.00025 in. The pushing in and out of the knob inside of the hand wheel throws the stop mechanism in or out of engagement. The stop acts directly on the cross feed screw, which is said to be more effective than one acting on the cross slide. The stop is positive in action and no matter how far away from the work the tool may be fed it will always stop as indicated by the graduations. In this way accurate cutting to a given depth on both inside and outside work is insured and time is saved, because there is no guessing at the depth of the cut, the taking of several trial cuts to obtain a desired measurement is eliminated and there is no necessity for stopping the lathe to caliper a piece of work. Uniformity in making duplicate parts is secured, as the depth of cut cannot be varied by crowding the tool. If desired the stop can be used with a taper attachment.

A set of spur gears and a clutch in the headstock comprise the reversing mechanism for the cross and longitudinal feeds and the lead screw and is operated by a hand lever on the apron, which is connected to the reversing rod through levers. The special advantages of this feature are that the operator has control of his lathe from the apron, which greatly facilitates the production of work in large quantities and does away with the necessity of having a reverse belt on the countershaft. Adjustable stops on the reverse rod give an automatic stop for the carriage in either direction.

A deep web pattern of headstock is provided, with a large diameter cone pulley with steps wide enough for a 2½-in. belt. The spindle is of forged crucible steel and revolves at any one of 16 different speeds in large ring oiling bearings. The carriage is wide, with full length solid bearings on the V ways, which are kept free from dirt by felt wipers, which also spread the oil. A new patented binding device fastens the plain and the compound rests to the cross slide. This construction facilitates adjustments and the omission of the customary slots for the bolts of the binding device makes the cross slide stronger. A taper attachment

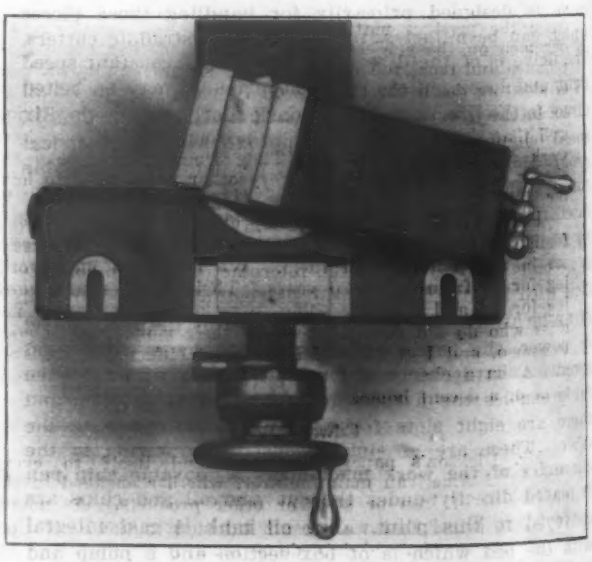


Fig. 2.—View Looking Down on Micrometer Cross Feed Stop.

can be affixed at any time, as all the carriages are so arranged. The cross feed screw has a large collar graduated to read in thousandths of an inch and the graduations are easily read, being spaced about 1-16 in. apart.

The apron is strongly reinforced by ribs and the gears are of coarse pitch with wide faces. An automatic safety device prevents the engaging of opposing feeds, as one is automatically disengaged as the other is thrown in. When cutting threads the feed gearing is disengaged and the longitudinal hand wheel does not revolve. The countershaft pulleys are of the improved friction type, with a large friction surface on the rim, and wear on the friction parts has been eliminated when the pulley is running idle. Ample wearing surfaces on the shaft are provided by extra large pulley hubs, and the belts do not need to be thrown off when oiling the pulleys.

New Tools and Appliances

This is essentially a news department for which information is invited.

New Applications of the Johannson Gauge.—A number of new uses for the Johannson gauges which are handled in this country by the Grönkvist Drill Chuck Company, Jersey City, N. J., have been recently made. In one the base has a vertical member similar to a surface gauge and is used as a measuring machine for testing measuring rods. A second application is to use the gauge in combination with a scribing block to form a hight gauge and in the third the gauge is used as a precision trammel for accurately scribing distances or circles from a prick punch mark as a center.

Continuous Milling Machine.—The Barber-Colman Company, Rockford, Ill., is manufacturing a milling machine, which is designed to load and unload without stopping and to be continuous in operation. This feature is secured by strapping a number of pieces in a suitable fixture to a rotary table, the feed being continuous in one direction and passing the pieces under the cutters in a circular path, each one being removed after it has been milled and its place taken by a rough casting or forging. It might, perhaps, be inferred that the machine is designed for circular work, but such is not the case, as while such work can be handled conveniently the machine is designed primarily for handling those pieces which can be milled with face, side or straddle cutters. The drive is of the direct gear type from constant speed tight and loose pulleys, and the machine may be belted direct to the line shaft or to a jack shaft as desired. Six speed changes, ranging in approximately geometrical progression from 20 to 200 rev. per min., are available through the use of transposing gears. The table is rotated through gearing and six feed changes are obtained by transposing gears. Setting the work and the cutters is accomplished by graduated micrometer dials in connection with hand wheels, the dials reading to thousandths of an inch. The table may be rotated by the hand wheel or power, the power being controlled by a clutch and lever. A hardened steel bushing in the center of the table enables the fixtures to be located accurately and there are eight slots for clamping the fixtures to the table. These are of simple construction owing to the character of the work machined. A movable chip pan is placed directly under the cut and oil and chips are conveyed to this point. The oil tank is cast integral with the bed which is of box section and a pump and fittings are regularly furnished. The floor space occupied by the machine is 44 x 68 in., and the net weight is approximately 3300 lb.

Floating Reamer.—The Kelly Reamer Company, Cleveland, Ohio, has made an improvement in its floating reamer which insures both accuracy and finish without grinding in cylinders ranging from 1 to 12 in. in diameter. The change consists of an adjustable, rigid, high-speed boring blade which is set immediately ahead of the reamer proper to take a final boring cut of about 0.01 in., leaving only 0.003 in. for the reamer to remove and thus reducing the amount of work done by the reamer blades.

A Worm Driven Vertical Milling Machine.—A new design of vertical milling machine has been brought out by the Newton Machine Tool Works, Inc., Twenty-fourth and Vine streets, Philadelphia, Pa. The special feature of this machine is that the drive is through worm gearing. The driving worm wheel is of large diameter and has a bronze ring with teeth of steep lead. The sleeve rotates in a bushed capped bearing which is bolted to the frame to permit adjustment. The spindle, which is 6½ in. in diameter and 21½ in. long, is driven with the sleeve by a double keyway. The power is taken through a 7-in. belt from a 30-hp. electric motor, having a speed of from 400 to 1200 rev. per min. The driving worm is of hardened steel fitted with roller thrust bearings and with the worm wheel runs in an oil bath. The feed and fast power traverse are carried through a double train of bevel gears, giving reverse to both motions. All gears are steel or bronze and all movements are clutched. The circular table is 60 in. in diameter, entirely surrounded by an oil pan and has an exceptionally large center bearing in the table saddle. The cross saddle has square lock gibbed bearings on the base and adjustments are made by taper shoes.

The British Iron Market

The London *Ironmonger* of November 12 comments as follows on iron trade developments:

The situation is still overclouded by the labor troubles, which, so far from clearing off, are rather becoming more ominous. The ballot of the boilermakers shows a big majority against the acceptance of the agreement arrived at between the employers and the employees at York, and it is beyond the wit of man to foresee the end of the turmoil. As for South Wales a squabble about the rate of pay for working in what is known as abnormal places—that is, places where the coal is difficult to get at, and where it is therefore harder to earn an average day's pay—has led to a state of affairs not far removed from civil war. Under these circumstances there is little room for surprise that the tendency of No. 3 Cleveland warrants should have been reactionary, but it is astonishing that prices should not have sustained greater depreciation than is the case. Makers of Cleveland iron, however, are taking matters very calmly, having pretty good order books, and under the circumstances being content to wait for higher prices. The shipments are better than last month and show an improvement all around, while stocks continue to increase. Finished iron is quiet, but steady, and steelmakers have a big tonnage on their books, but are becoming nervous at the prolongation of the shipbuilding trouble. Some people are looking for a moderate "boom" in American trade following upon the Democratic victories, but America is still trying to postpone deliveries of Spanish ore, which does not look very hopeful. Business continues very slack in the steel rail trade. A couple of orders have been placed on the West Coast—1300 tons for the India Office and 5000 tons for the Burma Railways being intrusted to the Barrow Hematite Company. Belgian works are reported to have booked fair orders lately, including 4000 tons for Uruguay, 10,000 tons for Mexico and 6000 tons for Chili and Portugal.

Plans have arrived from England for the dry dock that is to be built at Owen Sound, Ont. It is stated that $750,000 preferred 5½ per cent. stock has been placed in the British market. The plans include arrangements for a shipbuilding plant.

The Springfield-Brandes Vertical Grinding Planer

A Powerful Machine Containing Various Improvements

The Springfield-Brandes vertical grinding planer contains a number of important improvements upon its predecessors in the line of the Springfield Mfg. Company, Bridgeport, Conn. It is a heavy, substantial tool, grinding pieces 12 in. wide, 12 in. high by 4 ft. long, or is built with a longer capacity if so desired, and has been adopted by its builder as a standard type. The size of the tool may be judged from its weight, which is 8000 lb. The wheel is 16 in. in diameter, mounted in a chuck which permits of changing quickly, and is protected by guards to insure against accidents in case of injury to the wheel. Fig. 1 gives a general view of the machine, while in Fig. 2 are shown samples of work ground.

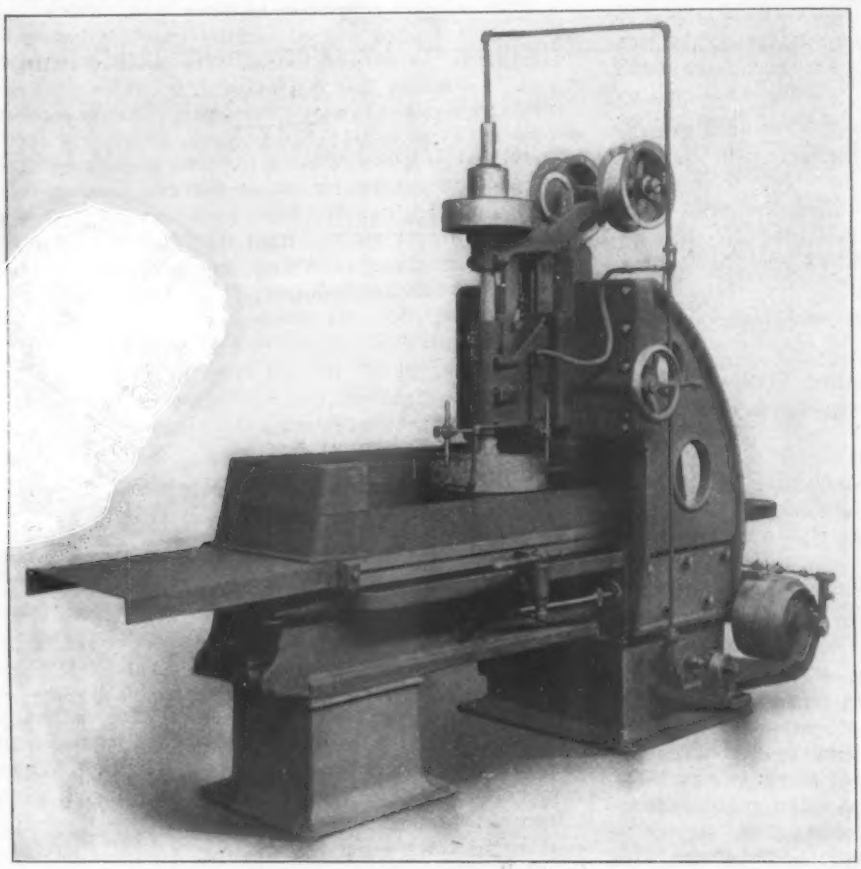


Fig. 1.—The Springfield-Brandes Vertical Grinding Planer Built by the Springfield Mfg. Company, Bridgeport, Conn.

The wheel head and spindle are of exceptionally heavy design, the latter being of large diameter and mounted in long bearings, which are arranged with a ball thrust on the under side and with a ball bearing spring take-up on the upper part, to prevent back lash when the wheel is running off the work. The driving pulley is mounted upon an independent bearing, which relieves the spindle of all strain of the belt. The aim has been to give the machine the stiffness and rigidity of a modern planer. The table drive is of the usual planer construction, except that the power is transmitted through a worm and worm gear on the rear of the machine direct to a substantial screw which runs in a long nut to insure long life and a smooth action of the table. The guard around the table is made in sections on the front side, to permit of easy access to the work. Fig. 1 shows a part of the upper section of the guard removed.

The machine is shown equipped with a hand wheel for feeding the wheel to the work, and with a micrometer dial to facilitate the setting and for getting sizes. The planer is furnished with a power feed, if desired.

A pump supplies lubricant to the wheel, reaching it either through the spindle or from the outside. A new feature is a deflector for use when water is admitted through the spindle. Being located on the under side of the wheel the deflector serves to force the water to the periphery, constituting an essential feature in grinding narrow or interrupted surfaces.

The sample pieces shown in Fig. 2 are all cast iron with the exception of four; F, H, J and K. The piece A is 22 in. wide and 6¼ in. high, with two grooves about 15 in. long, and both sides were ground in

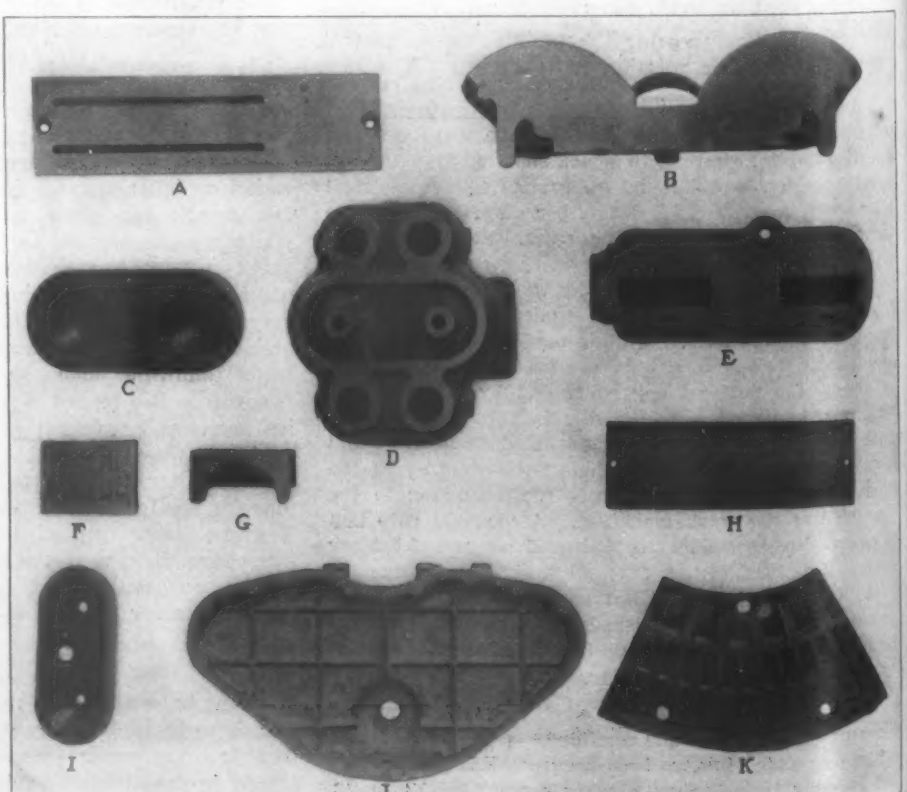


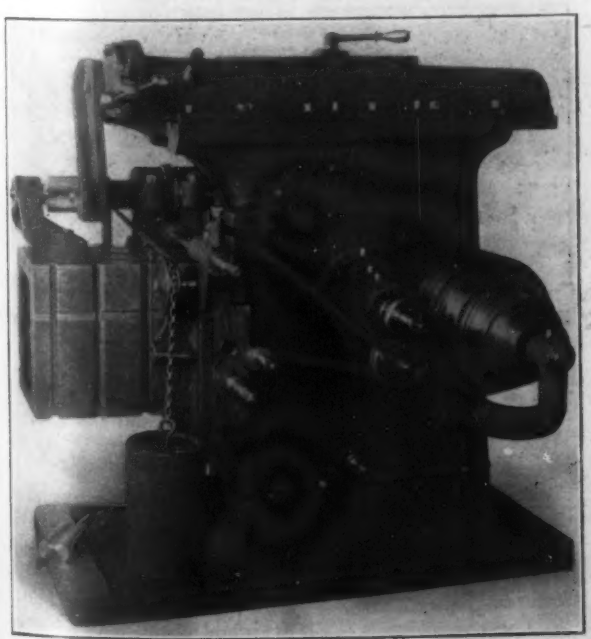
Fig. 2.—Examples of Work Ground on the Springfield-Brandes Vertical Grinding Planer.

14 minutes. B measures 24 in. long by 8 in. high, and required the same length of time. The casting C was finished in 8 minutes, and is 13 in. wide and 6 in. high. The piece D was ground in 12 minutes, while the casting E, measuring 7 x 16 in., took 10 minutes. F is a piece of hard die steel 6 in. wide and 4½ in. high, which was ground to a smooth surface in 4 minutes. The casting G was finished in 1 minute, its dimensions being 3 x 6¼ in. The mild steel piece H, measuring 15 in. wide and 5 in. high, was ground from the rough in 4 minutes. I is a casting 5 in. wide by 10½ in. high, which was finished in 1 minute, and J is a piece of aluminum, the hight of which was 12 in. and the extreme width twice that dimension, that required 3½ minutes for finishing. The segmental hard white iron piece K has an overall length of 18 in. and a radial length of 8½ in. Five minutes was required to grind this piece to a finish. In this connection it should be borne in mind that all of the above pieces were ground from the rough, which necessitated the removal of from 1-32 to ⅛ in. of stock, and that if the proper oversize for grinding had been allowed the time in every instance would have been very materially reduced, as much less stock is required for grinding than for planing or milling.

A New Rockford Shaper Attachment

A shaper attachment for machining the exhauster impellers of vacuum cleaners automatically was recently built by the Rockford Machine Tool Company, Rockford, Ill., for a customer and, as illustrated, is attached to one of the builder's 16-in. shapers, the tool with which it is designed to be used. A finished piece is shown on the base of the shaper and another impeller, ready for machining, is in position.

The construction of the fixture can be readily understood from the engraving. It consists of a head bearing, carrying a hollow spindle, with the work driver and the master plate on the inner end. The latter is of the exact shape of the work to be produced by the shaper. In operation the cross feed screw of the machine is removed, leaving the saddle with the work table free to move on the cross rail slide. A weight serves to hold the master plate against the roller, and the worm is fitted to the feed shaft with a sliding key, thus allowing the table to move forward and back with the rotation of the work. A casting clamped in a fixed position to the vertical slide of the shaper column supports the roller carrying stud. A round cutting tool of the same diameter as the roller is employed.



A 16-In. Shaper with Attachment for Machining Exhauster Impellers Made by the Rockford Machine Tool Company, Rockford, Ill.

In use this attachment has been found to be very satisfactory, it is stated, and the impellers are accurately and rapidly finished. Besides machining impellers, this fixture can be used for turning out cams or other irregularly shaped parts that can be rotated against the roller, the only restriction being that the pieces shall be free from curves.

Opening of the Permanent Exhibition of Safety

Several hundred persons were in attendance Monday evening, November 21, at the exercises marking the formal opening of the permanent exhibition of safety of the American Museum of Safety at the Engineering Societies Building, 29 West Thirty-ninth street, New York. Philip T. Dodge, president of the Museum, presided. Greetings were read from President Taft, Associate Justice Hughes, Director Kaufmann, president of the German Imperial Insurance Office, and directors of the European museums of safety. Remarks were made by Dr. Norman E. Ditman, chairman of the Department of Sanitation of the Museum; T. Commerford Martin, chairman of the Executive Committee, and Edson S. Lott, president of the United States Casualty Company. Mr. Martin said that the immediate need of the Museum is funds for increasing its exhibit space. He made a plea for $25,000 for this expansion.

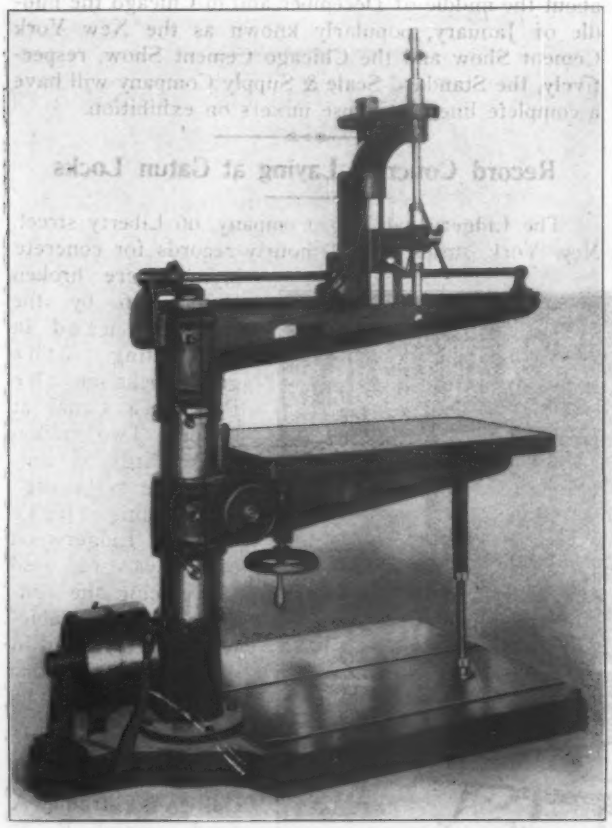
S. C. Dunham, president of the Travelers' Insurance Company, presented to the United States Steel Corporation the gold medal offered by his company to the individual firm or corporation that has done most for the protection of the lives and persons of their workmen by means of safety devices for machines and processes. W. B. Dickson, first vice-president of the Steel Corporation, accepted the medal on its behalf and reiterated what he had said on a previous occasion, that the Steel Corporation is willing to give to any other industrial company the benefit of its experience or the privilege of using its safety appliances. Prof. F. R. Hutton, chairman of the Jury of Awards, announced that the *Scientific American* gold medal for the best safety device exhibited at the Museum had been awarded to the Safety Scaffolding Company of New York for its design and construction of suspended platforms. He said that while these platforms are primarily designed for laying up wall, yet the results from their use had been so remarkable in safeguarding workmen that they must be classed as safety appliances of the first grade. The annual reports of the New York Health Department showed that in five years ending with 1908, when the old style of cantilever platform with horses was used, the falls of men from buildings and scaffolds were 660, of which 177 were from scaffolds. In the past two years 267 buildings have been scaffolded by the company mentioned and 6300 men have worked on them without the loss of a single life. Alfred E. Davidson, president of the Safety Scaffolding Company, accepted the medal.

The director of the Museum, Dr. W. H. Tolman, who spent the past summer in Germany studying accident prevention, showed lantern slides illustrating how Germany is saving 50 per cent. of the accidents to labor. He threw on the screen also some views illustrating the appliances employed by the United States Steel Corporation.

After the exercises in the auditorium opportunity was given for inspecting the various exhibits of safety appliances in the Museum on the sixth floor of the building.

The Taylor & Fenn Radial Sensitive Drilling Machine

The radial sensitive drilling machine shown is being built by the Taylor & Fenn Company, Hartford, Conn., for drilling holes up to ¾ in. in diameter, where it is necessary to cover surfaces on work that is too large or too heavy to be handled conveniently with the usual equipment. The adjustment of the arm and head, in



A Radial Sensitive Drilling Machine for Covering Large Surfaces Built by the Taylor & Fenn Company, Hartford, Conn.

conjunction with the application of drilling heads of different styles, enables the machine to cover nearly all drilling requirements within its range. Automatic power feed, lever feed, high speed sensitive drilling or tapping head, may be employed either singly or in combination.

The arm is rigidly constructed of heavy cast iron and is tubular in section. It has long bearings on the column, supported by a ball bearing thrust collar which permits it to swing with very little effort on the part of the operator. Under test, with heavy duty, the error in drilling at the end of the arm was very small, there being little spring even with large diameter drills. The drill head is of the company's standard type, with three changes of speed in a gear box. The spindle is positively driven by silent chain and gears, and is bored with a No. 2 Morse taper hole. The head is moved on the ways of the radial arm by a rack and pinion operated by a hand wheel, constituting a sensitive movement which in connection with the sensitiveness of the arm permits the drill point to be moved from one position to another on the work with much facility. Both the head and the arm are locked in position by binders, as is also the table, which is heavily ribbed and is furnished with a support for the outer end, for use with heavy work. The drive is from tight and loose pulleys, so that no countershaft is needed.

The details of the machine follow:

Length from center of column to end of arm, inches	42½
Maximum distance center of spindle to column, inches	36
Minimum distance center of spindle to column, inches	11
Maximum distance end of spindle to base, inches	48
Minimum distance end of spindle to base, inches	36
Maximum distance end of spindle to table, inches	26
Minimum distance end of spindle to table, inches	3¼
Traverse of spindle, inches	11
Length of feed, inches	4¼
Width of table, inches	20
Length of table, inches	35
Width of base, inches	24
Length of base, inches	36
Diameter of driving pulley, inches	10
Width of belt, inches	3
Speed of driving pulley, revolutions per minute	310
Hight overall with spindle at highest point, inches	79
Depth of base, inches	4
Floor space, feet	2 x 5
Approximate net weight, pounds	1,070
Approximate weight, crated, pounds	1,270

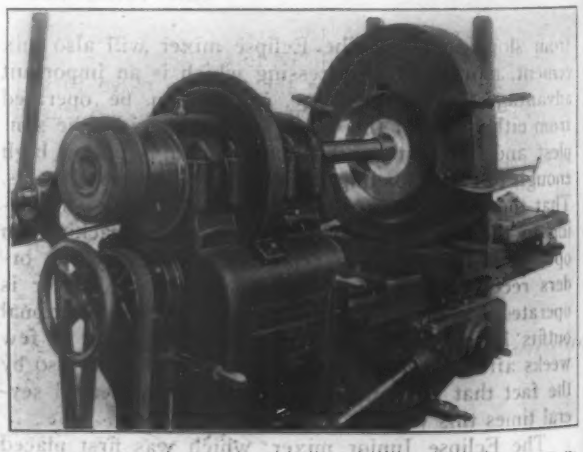
The accessories furnished with this drilling machine include all those ordinarily supplied with a tool of this nature.

A Heald Special Grinding Job

The adaptability of the cylinder grinder built by the Heald Machine Company, Worcester, Mass., to handle various classes of work, was recently shown by the special job which is illustrated herewith. The cam mounted in the grinder is one of two used on the shaft of an exceptionally large drawing press. When an effort was made to assemble the press it was found that the hole in the cams was too small, and it became necessary to enlarge it by grinding until its diameter corresponded with that of the shaft.

The cams were mounted on parallels on the table of one of the company's cylinder grinders and adjusted so that the axis of the hole to be enlarged was parallel with the grinding spindle and also with the travel of the table. Special grinding wheels had to be employed on account of the great diameter of the hole, and to secure the correct circumferential speed of the grinding wheel a large diameter wooden pulley was mounted at the left end of the spindle. Some idea of the difference in size between this wooden pulley and the one regularly used for grinding cylinders of automobile and gas engines can be obtained from the fact that the wooden pulley used was clamped outside of the regular pulley.

One of the particularly interesting features about the grinding of these cams was that it demonstrated



Enlarging a 14½-In. Hole in a Cam on a Cylinder Grinder Built by the Heald Machine Company, Worcester, Mass.

that the cylinder grinder is capable of handling more than the limited range of work usually expected. While it was, as its name indicates, particularly designed for grinding automobile cylinders, it can nevertheless handle a large amount of grinding on parts that are too large or inconvenient to rotate, and it is stated that for this reason results can be secured with it which are impossible on internal grinders of the ordinary type.

These two cams each weighed about 500 lb. The diameter of the hole through them was about 14½ in. and the amount removed by the grinder was between 0.025 and 0.03 in.

Improved Eclipse Concrete Mixers

An article in *The Iron Age*, April 8, 1909, illustrated the Eclipse concrete mixer made by the Standard Scale & Supply Company, Pittsburgh, Pa., and called attention to its advantages, especially its low charging platform, which is only about 24 in. high, and is mounted on a truck and carried with the outfit. The advantage of this is seen in the accompanying illustration showing Eclipse mixers in use; the saving of labor and material is evident.

Having the charging end of the drum entirely open has proved to be of great advantage in practice, enabling the operator to inspect the batch while mixing to see that it is in the desired condition before discharging, and also allowing easy access to the drum interior if necessary. The improved arrangement of mixing blades gives a thorough mix in a very short time, eliminates clogging and prevents the materials from slopping out. The Eclipse mixer will also mix cement, mortar or top dressing which is an important advantage. The discharge, which can be operated from either end of the drum, is claimed to be the simplest and quickest on the market, and is placed high enough to allow loading directly into barrows or carts. That the advantages of the Eclipse mixer are convincing to the contractor when they see the machines in operation, the company reports, is shown by the orders received from new sections where the mixer is operated for the first time, as many as six additional outfits have been sold to one locality within a few weeks after the first machine was started, and also by the fact that the output has had to be increased several times this year.

Eclipse Concrete Mixers Made by the Standard Scale & Supply Company, Pittsburgh, Pa., in Use on Street Paving Work.

The Eclipse Junior mixer, which was first placed on the market this season, has proved very popular, securing the advantages of batch mixing for small contracts, sidewalks, block plants, &c., where a light portable or small capacity machine is desired. It is of the same construction as the larger machine. To meet special conditions several new designs and outfits have been manufactured, including the following: A rear discharge machine with the gasoline engine beside the mixer at the rear of the truck, which allows a clear platform at the front of the truck for wheeling material and charging the mixer, and was designed for street paving work; an outfit with a charging hopper and hoist, the hopper being provided with a partition dividing it into two parts, one for stone or gravel and the other for sand, the cement being placed on the sand and the materials are shoveled directly into the hopper without the use of barrows and wheeling, an outfit with a hoist on the rear of the truck operated by the engine that drives the mixer, which is used for raising mixed concrete for high walls or different floors, and a traction outfit for moving the mixer forward on the job by power from the engine operating the mixer. Special mixers are made for other materials than concrete.

At the Cement Products Exhibition in New York about the middle of December and in Chicago the middle of January, popularly known as the New York Cement Show and the Chicago Cement Show, respectively, the Standard Scale & Supply Company will have a complete line of Eclipse mixers on exhibition.

Record Concrete Laying at Gatun Locks

The Lidgerwood Mfg. Company, 96 Liberty street, New York, states that all hourly records for concrete laying were broken October 6 by the cableways used in constructing the great locks on the Panama Canal at Gatun. Two million cubic yards of concrete are to be used in building these locks. Lidgerwood cableways are used for placing the concrete. These cableways are arranged in duplex form on four pairs of towers. The pair of cableways which broke the record are known officially as strand A and strand B of cableway No. 1. Strand A placed 49 cu. yd. in one hour and strand B placed 50 cu. yd. during the same hour. This means that the carriage on each strand made 25 trips per hour. The cableways were sold under a guarantee that they would make 20 trips per hour.

These cableways are arranged to give higher carriage speed than was ever attempted before for this class of work. This speed is rendered possible by important improvements made by Spencer Miller in anticipation of just such needs. With these improvements it is possible to use carriage speeds up to 2500 ft. per minute, as against speeds of 800 or 900 ft. per minute, which were as great as were before practicable. The cableways each have a span of 800 ft. between towers. They are actuated by electricity, and the control is as easy and simple and of the same character as the control of an up-to-date electric train. One operator controls the entire operation on each strand.

The statistics of the American Railway Association show that in the two weeks ending November 9 the increase in idle cars in the United States and Canada amounted to 6246, bringing the total idle up to 13,581. Of the increase, over 4000 cars are reported by the Northwestern States, being due to the lull following the active crop movement.

Washington advices are that it is not expected that a reciprocity agreement with Canada will be sanctioned at the coming short session of Congress, which ends March 4. Representatives of the Canadian Government are expected to visit Washington in January to take up the final negotiations.

The B. H. Rotary Cleaner for Raw Material

The problem of removing scale and rust from structural steel before fabricating is more or less of a serious one to companies handling pieces of this nature. Scrapers, wire brushes, emery grinders, sand blast, &c., are variously used, but generally are open to the objections of expense, slowness or ineffectiveness. Its own unsatisfactory experience led the Brown Hoisting Machinery Company, Cleveland, Ohio, to get out the tool illustrated herewith which is now called the B. H. rotary cleaner for cleaning raw material after it has been unloaded in the store yard and cut to size before

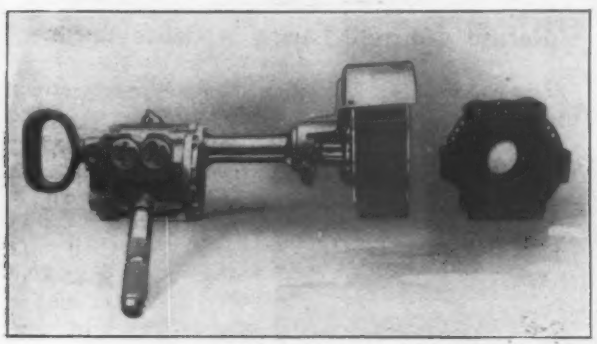


Fig. 1.—The B. H. Rotary Cleaner Made by the Brown Hoisting Machinery Company, Cleveland, Ohio.

going into the shop. It was designed to eliminate all the faults of the other methods, and was given a thorough test on actual work before being offered to the trade. Fig. 1 shows the cleaner attached to a pneumatic high-speed grinder, Fig. 2 is a view of the tool in use for removing rust and scale from structural iron, and Fig. 3 illustrates pieces of structural iron both before and after cleaning.

As will be noticed from Fig. 1, the cleaner consists of two circular plates mounted on the same hub and supporting a series of pins at their circumferences upon which steel blades or cutters are carried. These blades are rectangular in cross section, and the hole through which the pin passes is elongated to secure the maximum efficiency in service.

In operation the cleaner is used with a high-speed electric or pneumatic grinder, as shown in Fig. 2. The manufacturer claims that it is more convenient, efficient and economical than the sand blast or emery grinder, and its effectiveness is said to be due to the chipping blows of the blades, which remove the scale and rust from structural iron readily. The design is simple, and all parts are interchangeable. The tool is free from jar in use, and one man is said to be able to turn out as much work as 8 or 10 men with scrapers

Fig. 2.—Removing Rust and Scale from Structural Iron with a B. H. Rotary Cleaner.

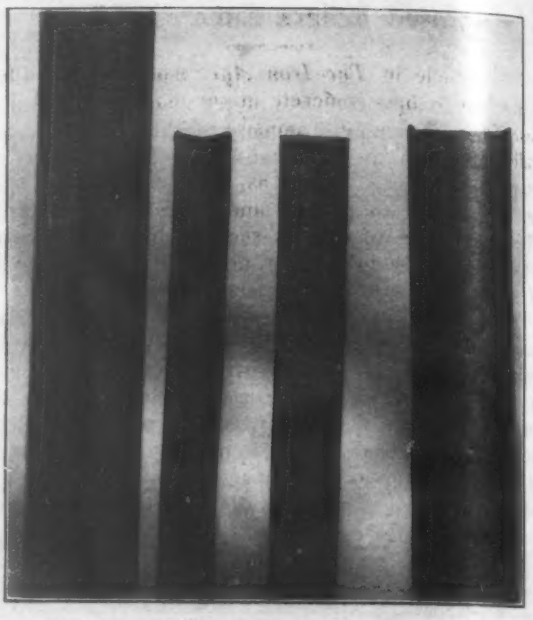


Fig. 3.—Specimen Pieces of Structural Material Before and After Cleaning.

and with better results. Besides cleaning structural steel with the results illustrated in Fig. 3, the cleaner can also be used for cleaning castings, surfacing building stone and removing barnacles from ship bottoms.

The Promotion of Industrial Education

Friday's sessions of the fourth annual convention of the National Society for the Promotion of Industrial Education, at Boston last week, were given over to the subjects of apprenticeship and corporation schools, part time and evening schools, and in the evening to an address by Dr. Georg Kerschensteiner, superintendent of schools of Munich, Germany, on "Continuation Schools of Germany."

The apprenticeship and corporation schools were discussed by Magnus W. Alexander, General Electric Company, Lynn, Mass., chairman of the section; Tracy Lyon, Westinghouse Electric & Mfg. Company, Pittsburgh, Pa.; F. W. Thomas, supervisor of apprentices, Atchison, Topeka & Santa Fé Railway, Topeka, Kan.; Samuel F. Hubbard, superintendent North End Station, Boston, and George C. Cotton, Solvay Process Company, Syracuse, N. Y., with a summation by G. M. Basford, assistant to the president, American Locomotive Company, New York.

In the afternoon Dr. Paul H. Hanus, Harvard University, was chairman; W. B. Hunter, director of the industrial department, Fitchburg High School, Fitchburg, Mass., read a paper on "The Fitchburg Plan"; Adelbert L. Safford, superintendent of schools, Chelsea, Mass., on "The Beverly Industrial School"; Frank B. Dyer, superintendent of schools, Cincinnati, Ohio, on "The Public Schools and the Apprentices of Cincinnati"; Stratton D. Brooks, superintendent of schools, Boston, on "The Evening Schools of Boston," and C. A. Prosser, deputy commissioner of education, State of Massachusetts, on "Evening Industrial Schools of Massachusetts." The summation was by Dr. David Snedden, commissioner of education of Massachusetts. A large attendance filled the spacious hall of the Boston Public Library.

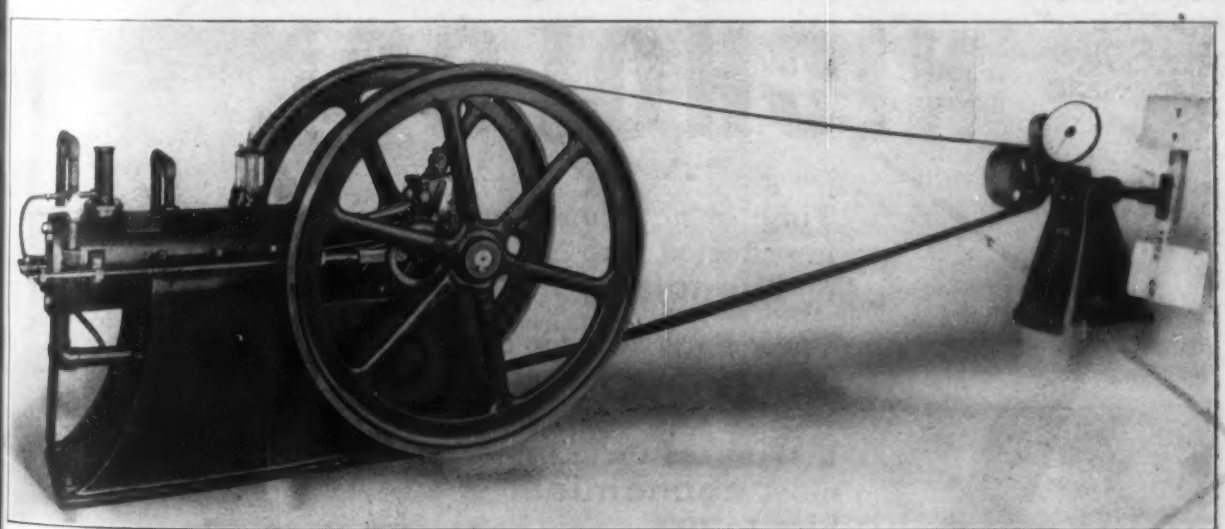
Dr. Georg Kerschensteiner, who is visiting the United States upon the invitation of the National Society for the Promotion of Industrial Education, is to give two public addresses in New York City, one on Monday, November 28, at 8 p.m., at the De Witt Clinton High School, Fifty-ninth street and Tenth avenue, upon "Day Technical Schools of Germany," and the other under the auspices of the American Society of

Mechanical Engineers, the American Institute of Electrical Engineers, and the American Institute of Mining Engineers, at the building of the United Engineering Societies, 29 West Thirty-ninth street, on Thursday, December 8, at 8.15 p.m., upon the "Industrial Continuation Schools of Munich." Dr. Kerschensteiner has stood for many years at the head of the progressive movement in Germany for more practical industrial education. He is largely responsible for the development of the part-time schools in Munich that are attended by all the apprentices and other boys and girls at work between 14 and 18 years of age.

The Tracy Fan Dynamometer

The fan type of dynamometer illustrated was designed by Joseph Tracy, 116 West Thirty-ninth street, New York City, as a convenient and inexpensive means for testing stationary gas and other engines of 100 hp. or less at comparatively slow speeds. Heretofore the fan dynamometer has been used for testing fast running automobile engines, direct connection being made between the engine and the fan, but it is said that the application of the belt drive in testing slow running motors has worked out satisfactorily. This type of dynamometer may also be used for supplying a load to absorb the power when "running in" an engine or working down the piston and bearings. No electrical or water connections are required and all the power developed by the engine is employed in driving the fan against the resistance of the atmosphere. The absence of all mechanical or electrical resistance in connection with the dynamometer does away with troubles due to heating or seizing, and it can be run indefinitely without any attention. Readings of the speed and power can be taken from the dial at any time.

The accompanying illustration shows a simple method of testing an engine with this dynamometer where a pulley is mounted on the shaft of the latter and connected by a belt to the flywheel of the engine. It is recommended that the diameter of the pulley be smaller than the flywheel, especially in cases where the speed is less than 800 rev. per min., as that is the speed at which the dynamometer is the most efficient. In operation, the pointer on the dial indicates the horsepower developed, less a slight transmission loss through the belt. The speed of the engine is obtained by dividing the indicated speed on the dial by the ratio between the pulley and the flywheel diameters.

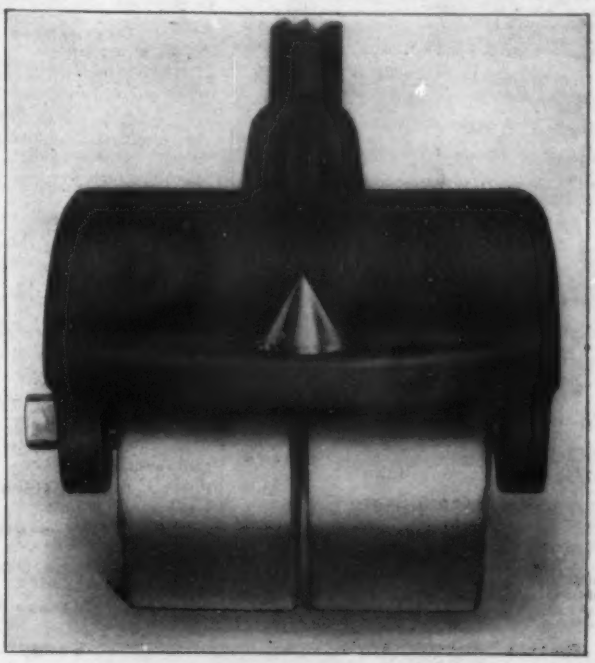


A Fan Dynamometer for Testing Stationary Engines Designed by Joseph Tracy, New York City.

The Dominion Iron & Steel Company's output in October consisted of 22,058 tons of pig iron, 27,034 tons of steel ingots, 26,113 tons of blooms, 15,375 tons of rails, and 4743 tons of wire rods.

The Grover Hand Truck for Industrial Plants

A truck for handling extraordinarily heavy pieces by hand in manufacturing plants has been designed by the Grover File Company, Nashua, N. H., and is illustrated herewith. It operates on the principle of a lever in which the power is applied through a long handle fitting into the socket shown in the upper part of the engraving. The wheels are the fulcrum and the nose, which contains a steel point to secure a better grip on the work, is the lever arm. The two wheels revolve independently of each other, thus facilitating the turning of corners. Several of these trucks are used for large pieces, which gives a three or four point bearing, as may be required. The proportions of the truck are very similar to those of the ordinary heavy crowbar.



Details of the Nose and Wheels of a Special Truck Designed by the Grover File Works, Nashua, N. H.

The Universal Portland Cement Company, Chicago, states that its plant No. 6 at Buffington, Ind., will have an output of 4,000,000 barrels per annum when completed, giving the company a total output of 12,000,000 barrels per annum. This plant, however, will not be completed until July, 1911, and will therefore only produce about 2,000,000 barrels during the coming year, making the total output for 1911 10,000,000 barrels.

CURRENT METAL PRICES.

The following quota[illegible] small lots, New York. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:

1 to 1¾ in. round and square	₩ lb 1.90¢
1½ to 4 in. x ⅜ to 1 in.	₩ lb 2.10¢
1½ to 4 in. x 1/16 to 5-16	₩ lb 2.10¢
Rods—½ and 11-16 round and square	₩ lb 2.10¢

Angles:

	Cts ₩ lb
3 in. x 1/4 in. and larger	2.10¢
3 in. x 5-16 in. and [illegible] in.	2.35¢
1½ to 2½ in. x 1/4 in.	2.20¢
1½ to 2¼ in. x 3-16 in. and thicker	2.10¢
1 to 1¼ in. x 3-16 in.	2.20¢
1 to 1¼ x 1/4 in.	2.30¢
⅜ x ⅛ in.	2.40¢
½ x ⅛ in.	2.50¢
⅝ x ⅛ in.	3.50¢
½ x 3-32 in.	4.35¢

Tees:

1 in.	2.65¢
1¼ in.	2.45¢
1½ to 2½ x 1/4 in.	2.15¢
1½ to 2½ x 3-16 in.	2.35¢
3 in. and larger	2.15¢
Beams	2.10¢
Channels, 3 in. and larger	2.10¢
Bands—4 to 6 x 5-16 to No. 8	2.30¢
"Burden's Best" Iron, base price	3.15¢
Burden's "H. B. & S." Iron, base price	2.95¢
Norway Bars	3.60¢

Merchant Steel from Store—

	per lb
Bessemer Machinery	1.90¢
Toe Calk, Tire and Sleigh Shoe	2.50@3.00¢
Best Cast Steel, base price in small lots	7¢

Sheets from Store—

Black

	One Pass, C.R. Soft Steel.	R. G. Cleaned.
No. 16	₩ lb 2.55¢	2.80¢
Nos. 18 to 20	₩ lb 2.70¢	2.90¢
Nos. 22 and 24	₩ lb 2.75¢	3.00¢
No. 26	₩ lb 2.80¢	3.10¢
No. 28	₩ lb 2.95¢	3.30¢

Russia, Planished, &c.

Genuine Russia, according to assortment ₩ lb 12 @14½¢

Patent Planished, W. Dewees Wood. ₩ lb A, 10¢; B, 9¢ net.

Galvanized.

Nos. 12 and 14	₩ lb 2.95¢
Nos. 22 to 24	₩ lb 3.30¢
No. 26	₩ lb 3.50¢
No. 28	₩ lb 3.80¢

No. 29 and lighter 36 inches wide, 25¢ higher.

Genuine Iron Sheets—

Galvanized.

Nos. 22 and 24	₩ lb 5.75¢
No. 26	₩ lb 6.25¢
No. 28	₩ lb 7.25¢

Corrugated Roofing—

2½ in. corrugated.	Painted	Galvd
No. 24	₩ 100 sq. ft. $3.85	4.40
No. 26	₩ 100 sq. ft. 2.95	4.00
No. 28	₩ 100 sq. ft. 2.60	3.75

Tin Plates—

American Charcoal Plates (per box.)

"A.A.A." Charcoal:

IC, 14 x 20	$6.35
IX, 14 x 20	7.60

A. Charcoal:

IC, 14 x 20	$5.40
IX, 14 x 20	6.50

American Coke Plates—Bessemer—

IC, 14 x 20, 107 lb	$4.40
IX, 14 x 20	5.40

American Terne Plates—

IC, 20 x 28 with an 8 lb. coating	$8.50
IX, 20 x 28 with an 8 lb. coating	10.50

Seamless Brass Tubes—

List November 17, 1908. Base price 18¢

Brass Tubes, Iron Pipe Sizes—

List November 13, 1908. Base price 18¢

Copper Tubes—

List November 13, 1908. Base price 21¢

Brazed Brass Tubes—

List August 1, 1908. 19½¢ ₩ lb

High Brass Rods—

List August 1, 1908. 14½¢ ₩ lb

Roll and Sheet Brass—

List August 1, 1908. 14½¢ ₩ lb

Brass Wire—

List August 1, 1908. 14½¢ ₩ lb

Copper Wire—

Base Price. Carload lots mill 14½¢

Copper Sheets—

Sheet Copper Hot Rolled, 16 oz (quantity lots) ₩ lb 18¢

Sheet Copper Cold Rolled, 1¢ ₩ lb advance over Hot Rolled.

Sheet Copper Polished 20 in. wide and under, 1¢ ₩ square foot.

Sheet Copper Polished over 20 in. wide, 2¢ ₩ square foot.

Planished Copper, 1¢ ₩ square foot more than Polished

METALS—

Tin—

Straits Pig ₩ lb [illegible]

Copper—

Lake Ingot	₩ lb 14[illegible]
Electrolytic	₩ lb 14[illegible]
Casting	₩ lb 14[illegible]

Spelter—

Western ₩ lb [illegible]

Zinc.

No. 9, base, casks ₩ lb 6¼¢ | Open [illegible]

Lead.

American Pig	₩ lb 5 [illegible]
Bar	₩ lb [illegible]

Solder.

½ & ½, guaranteed	₩ lb 22½¢
No. 1	₩ lb 20½¢
Refined	₩ lb 18½¢

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Cookson	₩ lb [illegible]
Hallett's	[illegible]
Other Brands	[illegible]

Bismuth—

Per lb $2.00@$2.25

Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in ingots for remelting [illegible]

Rods & Wire [illegible] Base Price

Sheets [illegible] Base Price

Old Metals.

Dealers' Purchasing Prices Paid in New York

	Cents—
Copper, Heavy cut and crucible	₩ lb 11.00@11.25
Copper, Heavy and Wire	₩ lb 10.75@11.00
Copper, Light and Bottoms	₩ lb 9.75@10.00
Brass, Heavy	₩ lb 7.25@7.50
Brass, Light	₩ lb 5.75@6.00
Heavy Machine Composition	₩ lb 9.75@10.00
Clean Brass Turnings	₩ lb 7.25@7.50
Composition Turnings	₩ lb 8.25@8.50
Lead, Heavy	₩ lb [illegible]
Lead, Tea	₩ lb [illegible]
Zinc Scrap	₩ lb [illegible]

NICHOLSON U.S.A. TRADE MARK

NICHOLSON

NICHOLSON U.S.A. TRADE MARK

Time is not the only saving effected through the use of **Nicholson Files.**

Their hard cutting surface and perfect temper gives them a **lasting quality** that makes them by far the most **economical** of all files to use.

Our Catalog shows what styles to use. Our book, "File Filosophy," tells how best to use them.

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